GAS JOURNAL

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THE GAS BILL

THE Gas Bill passed its concluding stages in Committee in the House of Lords on Monday of last week. At the outset there was some argument concerning co-partnership schemes, and the Lord Chancellor remarked that it was obvious that difficult questions might arise as to what was to be done to wind up co-partnership schemes. It was self-evident that as far as possible effect should be given to the wishes of co-partners. But to suggest, as had been suggested by the Opposition, that the Minister should have no power to act unless he had the consent of the co-partners was to put him in an impossible position. He reiterated that the Minister should have regard to the wishes of co-partners ; the Minister would be desirous of carrying with him the majority of the co-partners in any arrangements that he might find it necesasry to make. On this assurance an Opposition amendment to the clause dealing with co-partnership schemes was withdrawn.

Dealing with the clause relating to the compensation of officers, Viscount Ridley said it would seem only reasonable that the amount payable by way of compensation should be related to the number of years that an officer had served; but a regulation in the Town and Country Planning Act said that below eight years' service an officer got nothing. All such matters, said the Lord Chancellor, would be discussed, and as far as possible agreed, with the trade unions. "It may," he continued, "be objected that the trade unions do not necessarily cover the higher grades of employee. In answer to that, I will give this further assurance—that the Minister will consult also with those organizations which represent the higher grades. Thus we have given assurances to the National Joint Council for Gas Staffs and also to the Gas Engineers' National Guild. And generally I may say that in making our regulations we will discuss with the appropriate organizations covering all grades, from the highest to the lowest, in order to see that we evolve an appropriate set of regulations." Lord Teynham remarked that on that basis he thought the arrangement would be an excellent one. The Opposition amendment to the clause was withdrawn.

The only other clause to be discussed at length was that concerned with consumers' freedom of choice (Clause 64), Lord Rennell moving the insertion of the following new clause:—"Nothing in this Act or in any regulations made, or direction given thereunder, shall limit the right of any person to choose such available source of fuel and power of different kinds as he considers most suitable to his needs." His contention boiled down to absolute freedom of choice. "There are," he said, "personal predilections about gas and electricity. There are certain purposes for which one is more suitable than the other. It is a question of individual judgment. Where both are available and both are accessible, I think it would be generally agreed that there is no reason why the choice should not be open to the consumer. If that is not explicitly stated, however, there is a danger that, with the concentration of the use of fuel under the Minister of Fuel and Power, he may be tempted from time to time, possibly in order to show that one industry is not doing so badly as it appears to be doing or in order to stimulate it, to impose a limitation of choice upon areas in order to increase sales or consumption." Lord Rennell pointed to the possibility that, with new housing developments, an entirely new form of district heating derived from other sources might be held to be a good development. Indeed, it might be a good development ; but it should not be developed at the expense of existing installations or existing systems provided they remained up to date. Supporting the amendment, Viscount Ridley remarked that one must remember that a large quantity of gas was supplied to industry. It was very important that any industrial process depending on heat should have that heat available in the cheapest and most economical form. "We must run our productive industries as economically and efficiently as possible. . . . It would be wise to say that there will be no question of action by Area Boards, by the Gas Council, or by the Minister depriving the consumer of the right to choose the heat which he thinks will suit him best."

Lord Lucas of Chilworth described the amendment as both unnecessary and undesirable. He argued that there was nothing in the Bill to restrict consumers' freedom to choose whatever available fuel was most appropriate to their needs. There was no intention that there should be any such restriction, but it might not be desirable in the general economic interest and on general economic grounds that gas as well as electricity should be developed in remote rural areas. For that reason, the Minister might want to issue directions to the gas industry which would result in one of the fuels—gas—not being available to consumers in particular areas. Acceptance of the proposed new clause might make it difficult for the Minister to issue such directions although it would be in the public interest that they should be issued. The Lord Chancellor said that he firmly believed in competition between the nationalized gas industry and the nationalized electricity industry ; but there might be cases where it was undesirable. He was not prepared to accept the amendment which "applied an absolutely universal rule."

On a division the Government was defeated, the new clause being agreed to by 51 votes to 14. This concluded the Committee stage of the Bill.

COAL AND GAS PRICES

THE Report for 1947 of the National Coal Board, published last week, shows a deficit of £23 mill. This total included losses on colliery working of £9,200,000, but in the first quarter of the present year the collieries made an operating profit. Mined output of coal increased by 6 mill. tons in 1947. Higher wages and other benefits for the miners increased the cost of production by 2s. 6d. a ton, and the cost of production as a whole was about 4s. 3d. a ton more than in 1946. Manpower increased and stocks were built up. The loss of £23 mill.—which the Board explains is not a charge on the taxpayer—has been met from the Board's resources and must be made good in later

years—includes £15 mill. for interest and "interim income" and over £1½ mill. for loss on coal imports. Nor does the loss of £23 mill. prove anything about the efficiency or inefficiency of the nationalized industry. It was in larger measure the outcome of making the miner one of the most highly paid workers. There can be no question that the N.C.B. has not endeavoured to be a good employer, but in spite of all efforts and the utmost readiness to meet the men's trade union representatives, there were 1,635 unofficial strikes during the Board's first year of working, resulting in a loss of 1,652,000 tons. The report shows that the Minister of Fuel and Power scaled down price increases which the Board recommended, and that the increase in price to cover the effects of the five-day week was not introduced as soon as the Board would have liked. Other important aspects are that the number of workers increased by 26,000, the number at the coal face going up by 11,000; that absenteeism decreased from nearly 16% in 1946 to about 12½% in 1947 for all workers, and from 19% to 15% for face workers; and that the output rose—at the coal face from 2·76 to 2·86 tons.

The Board expresses its intention of introducing a new and rational price structure. The present price structure, the N.C.B. report states, is unrealistic because of the imposition during the war for administrative convenience of flat-rate increases. It adds that it is impossible to introduce a new price structure without first establishing a standard classification of coal by size and quality to which new prices can be related. After consultation with the Domestic and Industrial Consumers' Councils, the Board has adopted the recommendations in the report on the "Size Grading of British Coals" drawn up in 1946 by the British Colliery Owners' Research Association. There are, of course, many factors other than that of size, and the Board intends to consult organized bodies of distributors and consumers. In the meantime the Minister of Fuel and Power has granted an application for a new increase in the price of "good" coal to industry coupled with a reduction in the price of "poor coal." Prices of the lower grades and poorer qualities are reduced by amounts ranging from a few pence to as much as 15s. a ton, with increases, varying again from a few pence to about 3s. a ton, in the prices of large coal, graded coal, treated and untreated smalls, and unscreened coals of the better qualities. Coal supplied for domestic purposes will not be affected, but gas undertakings will have to pay for their coal at higher rates, the increases varying according to the grades and qualities of coal taken—or allocated, but probably averaging little under 3s. a ton more. This in its turn, must result in yet another increase in the price of gas, which again will give a fillip to the uneconomic burning of raw coal. Moreover, the increase in the price of gas will be the greater in that, since the price of coal has to be related to the price of domestic coal, it may not be practical to increase the price of coke to offset to a proportionate extent the increase in the price of coal used for gas-making. While we see with dismay the upward curve of coal prices, and therefore the costs of gaseous and solid smokeless fuel, we also see how much remains to be done to ensure that gas undertakings are in fact able to secure coals suitable for their carbonizing plants. Whither will this continued upward trend lead us?

ONE BOARD TO ANOTHER

THE Stretford and District Gas Board, whose annual report has just been issued, is the largest and most important of the few Joint Boards in the gas industry. The undertaking has a unique constitution, in that the representatives of three widely dissimilar local authorities—the Boroughs of Stretford and Sale and the Urban District Council of Urmston—combine together to foster good service to the public. "Perhaps," says Mr. John Grayston, Engineer, Manager, and Clerk, in contemplating with some misgivings the approach of nationalization in his report, "if there had been more Joint Boards there would have been no Area Boards." The Stretford and District Board is undoubtedly a good example of what can be achieved by mutual co-operation and effort, but it cannot be overlooked that as early as the Heyworth Report it was deemed that the principle of Joint Boards could not, of itself, afford a complete solution to the problem of effective integration.

The success of the gas industry has, as Mr. Grayston rightly says in his report, been built on local effort and local initiative. The industry has progressed because it has kept near to its public, and in the end the consumers have always been the masters and the industry their servant, and everyone in the industry will share his hope that in the future this local relationship will form the basis for the continued development of the public gas supply, and that local effort and initiative will remain unfettered and unimpaired. On vesting day, the undertaking will pass to the Area Board in its entirety, together with liability for its outstanding debt. Meanwhile, the Board is to be congratulated on being able to report that the past year has been a period of continued progress and success. The volume of gas sold was an all time record and the available profit balance has been prudently ploughed back into the undertaking to conserve its financial strength.

The Board has been mindful of its obligations to the employees, and in liquidation of a deficiency on the superannuation fund a sum of £23,712 invested in Government securities has been transferred from the Board's reserves to the superannuation fund; thus the Board has, so far as lies within its power, tried to safeguard the future of its employees.

SCIENTIFIC MAN-POWER

It will be recalled that the Barlow Committee estimated the number of qualified scientists in the country in 1946 at about 55,000, that the minimum demand by 1950 would be 70,000, and by 1955 90,000. The same report estimated that we could not expect more than 64,000 by 1955 unless the output of newly-qualified scientists was raised from its pre-war level of about 2,500 to 5,000 a year. The first annual report of the Advisory Committee on Scientific Policy, of which Sir Henry Tizard is Chairman, was published last week as a White Paper. To consider the directions in which scientific research is most likely to increase national productivity the Committee nominated a Special Committee under the Chairmanship of Sir Claude Gibb. This Committee says that the latest figures from the universities indicate that the level of 5,000 a year has almost been reached, and that the present output, if maintained, is therefore likely to meet the anticipated demand. These figures apply to "pure" scientists. The Committee found the position less re-assuring in the matter of applied scientists, but it appears likely that the supply of these men from the universities will be double what it was in pre-war years. While the contributions of pure science to industrial progress will certainly continue to be important, the Committee believes that quicker and more substantial results could be obtained by raising the standards of education with a view to introducing into the highest ranks of industry men who have had a specialized training in applied science after a sound education in the fundamental sciences. It is more concerned with training in higher technology than with the general technical education required by the rank and file of industry, and will submit a special report on this subject shortly.

MECHANICAL HANDLING

At a time when industry in this country is being exhorted to achieve greater production and our export trade is in danger of diminishing, due to the steadily rising costs of manufacture, every practice tending to slow up production process must be closely examined and, if possible, improved. All too frequently the bottlenech occurs in the moving of materials, whether in their raw state or as finished products, and it was in realization of this and in the knowledge that such delays can be remedied that the Mechanical Handling Exhibition, at Olympia from July 12-21, was organized. The use of mechanical handling equipment has, of course, become increasingly general during recent years, but it is clear that present methods can be improved and extended to the undoubted benefit of industry and the nation as a

whole. The scope for reduction of manufacturing and overhead costs applies to the gas industry as much as any other, and it may be confidently expected that those gas engineers who visited the exhibition found much to interest them. Among the very varied types of conveyors displayed there were certain notable developments, including the introduction of unit construction whereby any number of intermediate sections may be placed between separate head and tail units, and vibrator conveyors which can pass powdered and granular material in a steady, measured flow, no movement of the conveyor itself being visible. Overhead rail and chain conveyors also showed improvements in design, and of particular interest were woven wire conveyors which allowed the flow production system to be carried through furnaces, ovens, and quenching tanks. Cranes, hoists, mechanical shovels, and trucks all reflected current developments and refinements, and the exhibition proved a striking testimony to the inherent ingenuity and inventiveness of our manufacturers. The general organization of the exhibition (which is reported at length elsewhere in this issue) left nothing to be desired, and it is to be hoped that this new entrant to the range of national exhibitions will make further periodical appearances.

Personal

Mr. E. T. WARREN, Secretary and Chief Accountant of the Watford and St. Albans Gas Company, has been appointed a Deputy Chairman of the Watford Magistrates' Court.

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Mr. F. G. BROCKWAY, Engineer, Manager, and Secretary of the Cleethorpes Gas Company, having joined the Board has now become Engineer and Managing Director, and Mr. F. JANNEY has been appointed Secretary.

* * *

Mr. G. A. WOODWARK, Assistant Engineer at Beckton, has been appointed Assistant Works Engineer at the St. Albans Works of the Watford and St. Albans Gas Company in succession to Mr. R. E. PARSONS, who has accepted an appointment with the San Paulo Gas Company, Brazil.

* * *

Recent appointments announced by the Gas Light and Coke Company include those of Mr. J. M. GRAMMER, to be Stores Buyer with effect from Aug. 1, on the retirement of Mr. R. W. CRITTENDEN; Mr. A. J. D. HAMPTON, to be Station Accountant at Beckton; and Mr. A. L. WITT, to be Service Manager, Northern Division.

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Mr. B. H. MOORE has been appointed Sales Representative of George Wilson Gas Meters, Ltd., in the south of England to succeed the late Mr. A. E. Adams. Mr. Moore has been with the firm since his return from the Services and spent many months in the Coventry factory to obtain a thorough technical knowledge before being appointed Sales Representative in Scotland.

* * *

Mr. ASHLEY S. WARD, for many years Chairman of Thos. Smith & Sons (Rodley), Ltd., the Leeds crane and excavator makers, retired from the Board on June 30. Mr. FREDK. H. SMITH, as from the same date, relinquished his position as Joint Managing Director but remains on the Board in an advisory capacity. As a consequence of these retirements the following new appointments have been made: Chairman and Managing Director, Mr. F. R. STAGG, M.I.Struct.E.; Joint Managing Director, Mr. W. H. SHARP; Assistant Managing Director, Mr. T. N. F. SMITH. Mr. Ward and Mr. Stagg are Chairman and Joint Managing Director respectively of Thos. W. Ward, Ltd., with which concern Thos. Smith (Rodley) are closely associated.

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The Woodall-Duckham Vertical Retort & Oven Construction Co. (1920), Ltd., announces the following changes in the management of the Company with effect from July 1: Mr. F. B. RICHARDS, while retaining the Chairmanship of the Company, has relinquished his position as a Joint Managing Director. Mr. G. J. JACKSON will continue as a Joint Managing Director until his retirement from the Board on Dec. 31. Arrangements have been made to retain his services after that date in a part-time consultative capacity. Mr. Jackson will retain his seat on the Board of the parent Company—Woodall-Duckham (1920), Ltd. Messrs. J. S. JEFFREY and D. RIDER have been appointed Joint Managing Directors. Mr. T. C. FINLAYSON has been appointed Deputy Chairman. These changes are in conformity with the established policy of the Company in regard to retirement and are designed to secure continuity in the management of the Company's business.

Obituary

The death is reported of Mr. A. E. ADAMS, of Exeter, Area Manager of George Wilson Gas Meters, Ltd. He had served with the Company for over 23 years and was widely known, particularly in the south of England. The news of his death will come as a shock to many who saw him during the recent Institution Week in London.

Letter to the Editor

King's Manual on Gas Manufacture, Part 1

DEAR SIR,—The appearance of King's Manual is a culminating point in a campaign lasting nearly 30 years—a campaign always inspired by the presence of King's Treatise on the reference shelves, though long since no longer for reference. The industry had outgrown its early teachers. But Mr. Haynes, in his review published in the "GAS JOURNAL" of June 30, does a grave injustice (as I feel sure he will admit on reflection) to Alwyne Meade—and to Hornby and Davidson—by his omission of any reference to their efforts to provide the gas industry with a text-book. The campaign was also imbued with the realization that the text-book of to-day, covering an industry with so many ramifications, must be the work of a team, that it was beyond the power of any one man—a realization which was readily appreciated by the "GAS JOURNAL," by Sir Frederick West, and by others who were influenced to bring their power to bear upon the important object of this campaign.

Mr. Haynes' critique is generous and discerning. Perhaps, however, he just fails fully to appreciate that what you and your contributors had in mind was to produce a sincere book dealing with gas manufacture, into which would have to be compressed the results of a great deal of research, planned throughout to deal with the principles of gas manufacture as such, avoiding the temptation to wander into discussions of unproved processes or into an endeavour to cover interesting but irrelevant subjects of general engineering. The book was planned with the understanding that the student would bring to it a background knowledge of the ancillary subjects. In his review Mr. Haynes appears to be asking for something which was not intended.

In choosing subjects for treatment under the heading of coal and coke handling, for instance, the idea was to select those types of apparatus which have been more and more specialized to deal with gas-works problems rather than to compile a compendium of all the many appliances which have been at some time or other applied to these problems. Zimmer's monumental work shows to what lengths an exhaustive treatment of mechanical handling can go. The mechanical hot-gas producer is not, I think, yet ready for inclusion in a student's handbook. Several types are now being put forward and we shall hear much about them in the next few years.

There is one point in the critique which is distinctly painful to me and perhaps to your other contributors—that referring to the quality of the drawings and diagrams. Nothing should have been said about the reproduction of them—that is excellent—but it is impossible to make a good block from an indifferent drawing. One wonders whether Mr. Haynes quite appreciates the difficulties to be surmounted in getting any sort of drawings and diagrams made at all. Mere tracings of constructional engineers' working drawings are, of course, useless, but in the present state of unprecedented pressure on drawing office staffs one has to "make do" too often with a second best. It was recognized at the outset that the ideal arrangement would be to engage a good draughtsman, experienced in this class of work, to prepare all the block drawings in a uniform style, correctly proportioned to the size of the page—a style specially adapted to bring out, in the drawings, the principles of design without the unimportant detail. This ideal proved too difficult of attainment at the present juncture. Shall we be able to realize it in some later edition?

Mr. Haynes sees this publication as the result of a long-drawn-out effort. In its future development one idea must be kept firmly in mind. The book needs, not more profusion of detail, but a more and more refined selection of examples. The text-book must always be mainly concerned with principles, with only just sufficient detail to illustrate their application. It cannot and should not absolve the student from a constant study of the technical Press or from assiduous attendance at the meetings of his professional associations.

May I conclude by calling attention to the tremendous help afforded to the student by your excellent little paper "GAS." Not only does it enable the junior to keep in touch with the work of his brethren all over the country; it presents a picture of the excellent work put in by the Junior Associations in the study and discussion of the technical problems of the industry.

Yours faithfully,

T. A. TOMLINSON.

"Heathfields,"
18, Newcastle Road,
Leek.

July 12, 1948.

The Offices and Works of R. & A. Main, Ltd., Gothic Works, Edmonton, will close down for the annual holiday at 5.15 p.m. on July 23 and re-open at the normal starting times on Aug. 4.

The Export Assistance Department of the National Union of Manufacturers has issued a brochure to assist members needing guidance in conducting export trade. The brochure is obtainable from the Department at the Central Office of the National Union, price 10s.

MECHANICAL HANDLING EXHIBITION

THE first national Mechanical Handling Exhibition, held at the National Hall, Olympia, from July 12 to 21, was organized by the journal *Mechanical Handling* and had the support of the Association of Crane Manufacturers, the Foundry Trades Equipment and Supplies Association, Ltd., the Industrial Truck Manufacturers' Association, the Materials Handling Export Group, the Mechanical Handling Engineers Association, and the Truck and Ladder Manufacturers' Association. At the convention, held concurrently with the exhibition, 17 papers, illustrated by lantern slides, were presented; the section of the convention most closely affecting the gas industry will be reported in the "GAS JOURNAL."

The exhibition itself, which was admirably arranged, proved of considerable interest to overseas buyers, for whom extensive facilities were available.

In addition, visitors to the exhibition had the opportunity of seeing a colour film on "Mechanical Handling," relevant sections of which were also shown during the reading of papers. The film unit travelled over 10,000 miles to take shots, camera work being undertaken by Mr. Rex Calvert. Filming was done during the summer of 1947, weather permitting, and spring, 1948. The film was sponsored by the Mechanical Handling Engineers' Association, and was produced and directed by Mr. John Byrd, with Miss Bettina Braham, editor, and Mr. Neal Arden, commentator. The Association will make the film available, after the exhibition, to professional institutions and trade organizations who have problems involving the movement of goods. The film, which runs for about two hours, has been divided into four sections: (1) Coal and ash handling; (2) handling of bulk materials; (3) mechanization of movement of ferrous and non-ferrous metals; and (4) industrial handling; and among the many apparatus shown at work in the film are a number of special interest to gas engineers. The whole first section deals with various methods of handling, storage and reclaiming of coal and coke at gas-works. Mechanical grabs unload coal from ships at Beckton where it is mechanically weighed before being sent, by conveyor belts, to its destination. There are many types of conveyor belts shown which well demonstrate how mechanical handling equipment is always adapted to fit the particular local conditions. An oxide elevator plant is shown taking oxide up to purifiers at the Watford and St. Albans Gas Company, Watford, where also radial coke stocking conveyor and handling plant were filmed. With advantage shown in colour is a skip, at Tottenham, receiving a discharge of hot coke from retorts. A skip hoist for coke, screening plant, and bunkers were shot at Swindon. In section three of the film is shown mechanical equipment at a Scunthorpe coke oven. Coke, removed from the coke oven, is collected in a coke car and taken to the quenching tower; the car is seen coming back, its doors open and the coke goes via belt conveyor to the screening plant.

It is not possible in the space available to publish a detailed review of all the exhibits affecting the gas industry, but a selection of these stands is briefly described in the following report.

Trade Stands

On a neat and attractive stand, **Babcock & Wilcox, Ltd.**, featured by means of a large model the coal and ash handling equipment for a modern central power station, designed to receive shipments both of sea-borne and rail-borne coal. Various features of the installation were shown by enlargements of photographs and at the same time exhibits of actual parts were also shown on the stand, such as the following: gravity bucket elevator, paddle ash extractor pan, hydrovac ash ejector, windswept dust valve, dust mixer complete with rotary valve, ash pump. There was also a model railway wagon tippler and a model of a Babcock level luffing jib crane.

The **Chaseside Engineering Co., Ltd.**, featured two of their products, a 2 ton crane, finished in silver, and a mechanical shovel, finished in orange. The latter machine was particularly impressive, being as easy to manoeuvre as a car and yet extremely powerful and sturdy. This model has the equivalent capacity of 10 to 15 men in most handling problems. It shovels, transports and loads straight into a truck or hopper at high speed. Its low running cost provides a considerable saving on cost per ton in comparison with manual labour. The self-adjusting jib may be fitted, to enable the machine to operate under low headroom, and various types of scoops are available to suit a particular job.

The crane was built on the latest type of Fordson major tractor with pneumatic tyres.

George Cohen, Sons & Co., Ltd., showed the Super 15, Super 22, and the Super 44 models of the Jones mobile crane. The Super 15 broke new ground in that it was the first crane of its type to have power travelling. The Super 22 (maximum load 2 tons) is finding an increasing market for material handling in factories, warehouses, &c. in addition to its use by builders, contractors, &c. The Super 44 is a development of the Super 40 with increased lifting capacity (maximum load 4 tons). Certain detailed modifications are embodied which are the result of a production run of nearly 10 years. The heavier models are as suitable for grabbing duties as for ordinary lifting.

Finished in light red, cream, and black, the excellently designed stand of the **Ewart Chainbelt Co., Ltd.**, displayed a fine working model of a revolving spiral conveyor in a glass case without visible means of drive. A working model of a combined layout showing an elevator feeding into a hopper with a discharge feeding to a belt conveyor, which in turn fed to the boot of the elevator, was another attraction. The third working model was of a finger-tray type elevator, gravity roller conveyor and slat conveyor. Among the samples shown were a length of casing and chain showing section of a drag link type conveyor, a typical spiral as used in screw type conveyors, troughing idlers for belt conveyors, Ewart type conveyor chains, Pintle type chain, Grays type chain, Ley bushed type chain, drag link conveyor chain, chains used on sugar machinery, bottle conveyor chains and case conveyor chains, pole straps, malleable iron buckets, riveted steel buckets, pressed steel buckets, and skidder bars.

The pleasing effect of **Fraser & Chalmers Engineering Works'** stand was enhanced by the apple green and scarlet finish employed on their conveying and vibrating equipment. In the comparatively small amount of room available it was impossible to show anything but pictures of their heavy material handling equipment, but a very interesting display of materials handling by electro-magnetic means was arranged, together with a mechanically operated screen.

The main centre of attraction was three electro-magnetically operated conveyors in closed circuit with an electro-magnetically operated screen. There was a similar arrangement of laboratory size vibro-conveyors and screens. Other interesting units included a small reversible electro-magnetic vibro conveyor and a vibro conveyor for the heating or drying of materials by infra-red heating. A number of full-size electro-magnetically operated machines were shown, comprising a foundry box knockout, a full-size screen and feeder, a concrete mould consolidating table, a test sieve shaker, and bunker vibrators.

Goodall Clayton & Co. Ltd. had a dispaly which consisted largely of photographs showing the various classes of engineering and mechanical handling plant which they manufacture. For use in collieries there were screening plants, coal cleaning and washing plants, headgears, tipplers, picking belts, tub creepers and retarders, crushers, bunkers, chutes, feeders, hoists, gantries and elevators. Coal and ash handling plants, bunkers, hoppers, &c., were featured in the boiler house section, and the gas-works plant consisted of coal and coke handling plants, oxide elevators and conveyors, and ash handling equipment.

Intended primarily as an information bureau, the attractive stand of **W. J. Jenkins & Co. Ltd.** consisted mainly of a series of photographs and coloured drawings, together with components of the Company's gravity bucket conveyor and drag bar conveyors, both finished and unfinished.

One of the most effective stands was that of **Geo. W. King Ltd.**, which was painted green and cream, with red lettering, and showed a power-pulled overhead chain conveyor, a belt conveyor with a patented off-loading device, a full range of electric chain pulley blocks, comprising Minor, Major, and Mammoth models for loads from 5 cwt. to 10 tons. Overhead runway equipment featured King Supertrack monorail and switches, the Safelec busbar system of track electrification, and hand pulley blocks, including Ropelock hoists, and components for electric and hand operated overhead travelling cranes.

Most interesting of the excellent range of trucks exhibited by **Ransomes, Sims & Jeffries, Ltd.**, was an entirely new production, the Forklift 20 truck. This is a centrally controlled telescopic high lift fork stacking vehicle of 1 ton capacity, with electric hydraulic elevating mechanism and tilting mast, and fitted with an Exide 20 cell M.V.A.13 battery. Other electrically driven trucks on show included an E.N.U. 82-ton capacity, four-wheel steer, elevating platform truck, a N.U.3 2 ton capacity, two-wheel steer, fixed platform truck, an N.U. crane truck, four wheel steer, to lift 10 cwt. on the crane at 5 ft. radius, and to carry 30 cwt. on the platform, the T.3 four-wheel tractor, hauling capacity 6 tons, a three-wheel tractor, hauling capacity 20-30 cwt., a T.E.1H. three-wheel, 1 ton capacity, fixed platform truck, a driving unit for 2-ton trucks, and an elevating unit for 2-ton trucks.

Also exhibiting an impressive range of trucks, **Steels Engineering Products, Ltd.**, stressed the advantages of "body weight steering," which is an exclusive feature of their range of battery driven "Electric Eel" trucks. Steering is controlled with an instinctive, directional body movement, leaving the operator's hands free for the speed and brake controls. Also shown was a special all-electric model of the 1 ton mobile crane which demonstrated the performance of these fully-slewing versatile models with their comprehensive safety devices and operational simplicity. The present range consists of mobiles of 1, 1½, 3, 5, 6, and 12½ tons, plus lorry-mounted in 3 and 6 ton capacities. "Coles" electric hoists, with fully-enclosed and oil-sealed extra heavy-duty gearing, available in ½ to 6 ton capacities, were also displayed. The stand itself was admirably designed, the superstructure being dark blue with steel lettering, and the range of cranes finished in yellow.

The only piece of gas-operated equipment at the exhibition was

displayed by **Stewart Gill & Co., Ltd.,** who featured a Rapiradia radiant tunnel oven and overhead type conveyor.

This tunnel made use of 12 Potterton gas-heated infra-red panels and was constructed to the firm's standard Cleanline design, fabricated from 14G sheet aluminium, finished in Bengough grey anodizing. The design affords rapid radiant heating with regenerative convection. The overall dimensions of the tunnel were 10 ft. long, 7 ft. 6 in. high, and approximately 4 ft. wide. An integral canopy was fitted and allowed adequate ventilation of waste flue gases and solvents. An endless chain fitted with trolleys and work hangers at 2 ft. intervals constituted the drive equipment. At the exhibition this carried specimen products of the firm's clients.

Assuming articles, each 2 ft. by 20 in. are hung on each hanger at a conveyor speed of 2 ft. per minute, the drying period is 3 minutes. At this speed the curing temperature reached on work may be varied between 230-350° F. by adjustment of operating pressure or variation of conveyor speed.

On an attractive stand, **Stewarts & Lloyds, Ltd.,** showed a selection of exhibits chosen to demonstrate the advantages of using steel tubes in mechanical handling appliances. They included stillages of various types, barrow frames and sack trucks, a tilting table for moulding boxes, and trollies used to facilitate charging of coke ovens. In addition, a number of photographic enlargements of tubular steel appliances such as crane jibs, &c., were also displayed. In all these applications, it was claimed, the use of steel tube reduced weight and increased rigidity, while the tubes were of stout gauge, able to withstand the rough usage to which they were inevitably subjected.

As the normal products of **Strachan & Henshaw, Ltd.,** were necessarily too large to be accommodated on an exhibition stand, the full scope of the firm's activities was illustrated by means of photographs, large and small, two or three working models, and a series of block models. The purpose of the latter was to illustrate the main fundamental principles of the different forms of handling plant made by the firm, rather than the working details, and to show how individual items could be combined to solve special handling problems. Among the equipment were examples of a Rotaside wagon tippler, a transporter, and a telpher. The models were particularly good and with the smart pale blue and cream stand, formed an attractive exhibit.

The Triumph elevator, manufactured by **John Thompson (Triumph Stoker), Ltd.,** on view at the exhibition was of the chain and bucket type, having a capacity of 3 tons per hour. Although motor driven and automatically controlled, it could also be manually controlled. Lubrication was carried out from a centralized battery plate. The coal feed was controlled by an adjustable slide and direct-driven rotary paddle to prevent excessive feed and choking.

ROYAL SHOW AT YORK

THE striking and well laid out stand presented by the York, Harrogate and District Group of Companies at the Royal Show, York, last week, provided a "showroom window" of the latest gas appliances not only for the consumers in the 600 mile area of service of the Group, many of whom were visiting the Show, but also for visitors from overseas and all parts of the Kingdom. It was an outstanding effort, from the publicity point of view, for the gas industry.

Prepared by the publicity and display department of the Group, the stand and display units were tastefully decorated and the range of modern appliances covering everyday domestic equipment was arranged in sections, including cooking, space heating, water heating, and refrigeration. The industrial section consisted of a number of photographs showing the industrial application of gas in various industries, and there was also on view a beautifully made working model of a gas-fired radiant heating drying unit. A geographical map showing the area of service of the York, Harrogate Group occupied a prominent position and created considerable interest among the many visitors to the stand.

A large number of gas engineers and other guests visited the stand on Thursday, July 8, and later attended a luncheon in the Royal Station Hotel, York, at the invitation of the United Kingdom Gas Corporation, Ltd.

In proposing the toast of the gas industry, Alderman **H. Bolland** (Harrogate) said he hoped that when the industry was nationalized the new set-up would consist of men of experience in the industry, and not be controlled by politicians transferred from other less satisfactory projects. No doubt, he added, we should be told that any difficulties had been largely inherited, and time must be taken to plan with care. Alderman Bolland congratulated the York, Harrogate Group on the goodwill which they had established during the past 15 years and for the lead which they had given to the industry in the area.

Responding, Colonel **W. Moncrieff Carr,** Chairman, United Kingdom Gas Corporation, Ltd., said that any success his Corporation might have achieved had been due to the fact that they had not tried to direct, but to maintain the identity of local organizations. Gas supply must of necessity be a local matter, and local contacts must be maintained. His managers, he said, were wholly responsible for their undertakings, and were afforded every facility to enable them to give the cheapest and best service to the consumer. The success of the industry depended on this, because the public must have service, and they must be free to choose the best service. It would be catastrophic, if, under nationalization, sight were lost of this fact. Decentralization should be continued, under nationalization, said Colonel Carr, and the basic industries must be made to pay, because their cost was vital to the recovery of the country.

Colonel Carr went on to remark that there was an ever increasing demand for gas from the multifarious industries in the West Yorkshire area, and factories at the moment were waiting for an additional 10 mill. cu.ft. a day which the Corporation could not supply. West Yorkshire was an ideal territory for the production of gas in proximity to the pit-head, and there was economic justification for extending the West Yorkshire gas grid to three times its present capacity. New works under construction at Tingley would carbonize 1,000 tons of coal daily and augment the grid supply considerably, but the schemes for constructing coke ovens at Upton should also be allowed to proceed. These schemes would mean cheaper gas for industry and the people's homes. Continuing, Colonel Carr said there were at least five areas in Great Britain where the high-pressure gas grid pioneered in West Yorkshire could be duplicated with immediate benefit to consumers not only in increased supplies but in cheaper prices for gas—the only true justification for any kind of integration. These were the North-west coastal area, South Lancashire, and North Cheshire, the Midlands with Birmingham as centre, South Wales, and the area around Bristol and Bath. It was important, in his opinion, that in all such integration schemes the sources of gas supply should be under the control of the gas industry and not of the National Coal Board. It was inevitable that costs would mount and prices rise if part of the gas industry remained outside its own control.

Other speakers at the function were Mr. **G. A. Potter-Kirby,** Chairman, York Gas Company, Councillor **A. V. Milton,** Deputy Mayor of Harrogate, and Mr. **W. L. Pratt,** Chairman, National Glass Works (York), Ltd.

A tribute was paid to Mr. A. McDonald, General Manager, York, Harrogate, and District Group of Gas Companies, by Colonel **Carr** for the work he had done to make the Group exhibit such a succes at the Royal Show, and also for the hospitality they had received, which was entirely at Mr. McDonald's initiation. Mr. **McDonald,** replying, thanked Colonel Carr and said it was not a personal effort but a team effort by the staffs of the Group. He hoped they had put forward something worthy of the gas industry.

GOTHIC SPORTS GROUND RE-OPENED

Entirely without speeches, the sports ground of the Gothic Welfare Association at Theobalds Park, Cheshunt, was ceremonially reopened on July 17 by Sir Ernest Hiley, Chairman of Glover and Main, Ltd. The Hornsey British Legion Silver Band played the National Anthem, Sir Ernest Hiley unfurled the Club colours, the band played a fanfare, a bouquet was presented to Lady Hiley, and the visitors, including Colonel W. R. Glover and other members of the Board, and Mr. W. K. Tate, General Manager of the Portsmouth and Gosport Gas Company, with Mrs. Tate, proceeded to watch the afternoon's attractions.

The programme comprised a cricket match between the Portsmouth Gas Company (the Chairman's Eleven) and the Gothic Cricket Club; bowls matches between Edmonton Bowling Club and Gothic Bowling Club and between Edmonton Works and Edmonton Staff; and a tennis match between Ellenbro Tennis Club and Gothic Tennis Club; together with races for the children.

In delightfully rural surroundings the sports ground, 11 acres in extent and comprising football and cricket pitches and grass tennis courts, was handed over to the War Office during the war. At the end of hostilities the Directors of Glover and Main, Ltd., devoted a substantial sum to welfare purposes and several thousand pounds were spent on putting the sports ground into first class condition, levelling the pitches and constructing pavilions, a Cumberland turf bowling green, and five hard tennis courts.

Although the sports ground is within a few miles of the Edmonton works it is at present somewhat isolated, but with adjacent building developments it is hoped that bus services will be established in the near future.

Diary

July 27,—**Southampton Gaslight and Coke Company**: Centenary Luncheon, Polygon Hotel, Southampton, 12.45 for 1 p.m.
Sept. 14.—**Federation of Gas Employers**: Central Committee, Gas Industry House.

George Wilson Gas Meters, Ltd., announce that the annual holiday this year will be taken as follows: (1) Blackpool Works, July 17 to July 26; (2) Coventry and Wolverhampton, July 24 to Aug. 3; (3) Manchester, July 31 to Aug. 10. The London and Jarrow Works will not be closing, as their holidays are being staggered, and in the case of Coventry a skeleton staff will be available to deal with a urgent enquiries.

MANCHESTER DISTRICT ASSOCIATION AT HALIFAX

MEMBERS of the Manchester District Association of Gas Engineers were favoured with ideal weather for their visit on President's Day to Halifax, on July 2, when they were received by their President, Mr. James MacLusky, Engineer and General Manager of the Halifax Gas Undertaking. About 160 members of the Association attended and inspected the Mulcture Hall Road Gas-Works.

The history of gas supply in Halifax dates from 1822, in which year local business men obtained Parliamentary powers to form the Halifax Gas Light and Coke Company with an authorized capital of £12,000 for the purposes of "Lighting with inflammable air, carburetted hydrogen, or coal gas the town and township of Halifax." In 1856 the undertaking was transferred to the Halifax Corporation.

The present site contains nearly 11 acres, and a further four acres provide the site for the Stoney Royd gas-holder station, being situated one mile from the gas-works. The coal stores are more than 300 yards in length and are entirely roofed over. There is an elevated double rail track, allowing for all coal to be dropped into storage bays or into the elevator pits. These stores hold 15,000 tons of coal under cover, and trucks are handled by a 44 h.p. diesel driven locomotive.

With regard to the coal gas plant, No. 1 bench consists of six beds, each of four 6 ton continuous vertical retorts, built in 1922 by Drakes, Ltd. This bench was originally built with settings of eight 3 ton per day retorts, but was entirely reconstructed in stages during the war years. The retorts are upwardly heated and are served with a 50 ton per hour gravity bucket conveyor for handling coal and two 24 in. wide rubber band conveyors for coke handling. No. 2 bench consists of four settings each of eight 4 ton per day continuous vertical retorts, also built by Drakes, Ltd., in 1928. These retorts are now being reconstructed, as and when retort renewals are necessary. The average life of the silica retorts is 10 to 12 years.

During the present summer No. 10 bed will be dismantled prior to reconstruction. The retorts were last reset 12 years ago. All the mountings, extractors, &c., are part of the original plant but are to be replaced this year.

The coke from the two retort benches is conveyed by the band conveyors under the benches to a gravity bucket conveyor which transports the coke to the screening plant, situated inside the retort house. The screens are of the balanced Zimmer type and were constructed in the workshop of the undertaking nine years ago. The coke storage bunker has a capacity of 700 tons, and is used for the storage of unscreened coke at nights and week-ends.

There are two 150,000 cu.ft. per hour and one 200,000 cu.ft. per hour Waller four-blade type exhausters. The oldest exhauster is shortly to be replaced with a Waller Roots type 300,000 cu.ft per hour steam engine driven.

A new 3 mill. cu.ft. per day wet purification plant is under construction and includes the following:—

(*a*) Water tube condenser by Simon-Carves, Ltd.
(*b*) Electrostatic detarrer by Simon-Carves, Ltd.
(*c*) Livesey washer by Clapham Bros., Ltd.
(*d*) Static ammonia washer by Newton Chambers & Co., Ltd.

The existing plant, comprising a P. & A. tar extractor, Livesey washer, brush scrubber, all by W. C. Holmes & Co., Ltd., was built in 1922. There are also horizontal C.I. and steel condensers, a Laycock washer, and a 45 ft. tower scrubber.

Purifiers built during 1946-47 by Robert Dempster & Sons, Ltd., comprise six boxes each 40 ft. by 35 ft. by 6 ft. deep, together with oxide handling plant. A Holmes Connersville meter has recently been installed. This has a capacity of 6 mill. cu.ft. per day. A rotary meter is also available either as standby or to measure the gas passing through one section of the purifiers.

The benzole plant is capable if washing 5 mill. cu.ft. of gas per day and recovering up to 3 gall. per ton of coal carbonized. It comprises a standard Simon-Carves static washer, still, heat exchanger, oil cooler, pumps, &c.

Two units of carburetted water gas plant are installed. Both were constructed by Humphrey and Glasgow, Ltd. No. 1 plant, built in 1935, has a capacity of 500,000 cu.ft. per day. No. 2 plant, built in 1944, has a capacity of 750,000 cu.ft. per day.

A concentrated ammonia liquor plant capable of dealing with 1,000 gall. of raw liquor per hour was installed in 1917, and later made fully automatic. Only "free" ammonia is recovered at the present time. There are complete facilities for carrying out all classes of repair and maintenance work, and there is a very extensive central office block.

[Photo by permission of the *Halifax Courier and Guardian*

At the Halifax Gas-Works:—Left to Right: *John A. Drake, Chairman, Drakes, Ltd.; James MacLusky, President of the Manchester and District Association; R. Kelf-Cohen, Under-Secretary, and J. S. Smith, Principal Officer, Ministry of Fuel and Power.*

Three years ago a start was made with the preparation of plans for extensions to the works which would be necessary to keep pace with the growing output of gas. The monthly demand for gas has been as high as 41% over 1937-38 without abnormal climatic conditions, and the reserve of gas-making plant is now below the danger point. There is a large potential load which at present cannot be accepted because of shortage of gas-making plant during the winter months. The scheme for future development allows for four 3 mill. cu.ft. per day units of vertical retorts, all of which will be housed within the present retort house, together with the ancillary plant, waste heat boilers, dust collecting, and vacuum cleaning plants, &c. A new carburetted water gas plant house has been allowed for with an additional 2 mill. cu.ft. per day unit, which with the additional of existing units transferred to this house will provide a total maximum capacity of over 15 mill. cu.ft. per day of gas-making plant.

Of the gas output, 37% is supplied to industrial consumers. Total consumption has risen in nine years from 851 mill. cu.ft. to 1,086 mill. cu.ft.

Luncheon Speeches

Members of the Association, by invitation of the County of Halifax Light, Heat, and Power Committee, were entertained at luncheon at the Alexandra Hall, where a civic welcome was accorded to them by the Mayor of Halifax, Alderman **Charles Holdsworth, J.P.**

The toast of "The County Borough of Halifax" was proposed by Colonel **W. M. Carr, O.B.E., T.D.**, Chairman of the United Kingdom Gas Corporation, who said he regarded it as a very great privilege to have the opportunity of doing so in the centenary year of the borough. Although it so happened that it was the centenary year, nevertheless it should be borne in mind that Halifax was a very ancient town. From the year 1475, and for three centuries subsequently, Halifax produced more cloth than any other town in the country, but in later years it established many other industries. Industries in Halifax had expanded tremendously, and were now too numerous for him to mention in detail. All those concerned in the gas industry knew Halifax well. The great firm of Drakes, Ltd., with their works in the Ovenden area, though an old undertaking was constantly presenting new features for consideration, and the members would be privileged during the course of the day to inspect the up-to-date works which was now, in point of time, 101 years old. Another old firm was that of Joseph Morton & Sons, the well-known fireclay and silica manufacturers, and he could mention many others which were either established in Halifax itself or in close proximity to it. He would add that one reason why he valued the privilege of being invited to propose the toast was because of the association of his own family with the borough. His father's eldest brother, William Carr, whose namesake he was, acted as the Manager of the Halifax Gas Undertaking during the years 1876 to 1888. There were letters, said Colonel Carr, in his possession which his uncle wrote to his (Colonel Carr's) father, who was then Assistant at Todmorden, advising him how to carry on his work there. They were most entertaining letters. In those days, Yorkshiremen did not mince their words. The present, continued Colonel Carr, was not the first occasion upon which he had inspected the Halifax Undertaking, and he could declare that he had never seen them in better condition. The present Manager and Engineer, Mr. James MacLusky, was the third President of the Manchester District Association of Gas Engineers coming from Halifax. The first President was William Carr, the second one was Mr. MacLusky's father, and now the son was the recipient of the highest honour it was within the province of the Association to bestow upon one of its members. The industry owed much to Mr. MacLusky's father; for instance, he was a pioneer in the development of gas tariffs, and in many other respects. He had

been a worthy leader of them all to follow. It could be confidently anticipated that Halifax would continue greatly to assist the progress of the industry, and to be an important unit in the area, after nationalization.

Co-ordination

Halifax had an established position. It was correct that it failed in regard to certain co-ordination which he, Colonel Carr, might suggest ought to have taken place some little time ago, but he did not think that Halifax had missed many opportunities for advancement in other ways, even though it had missed participation in the development of the West Yorkshire Gas Distribution Scheme. However, what it had refused some 12 years ago it would participate in now whether it liked it or not. The record of service of the Borough of Halifax was a very fine one. The present President, and his father, had built up an excellent organization which was worthy of admiration by all. It bore testimony, also, to the virility of the borough and its Light, Heat, and Power Committee, because without the backing of an excellent municipal organization they could not have achieved what had been achieved.

was one who did not regard his daily work merely as a means of earning a living; he looked upon it as a vocation. He did not become a gas engineer by accident. They were all interested in the marvellous achievements which had been made in regard to the science of the carbonization of coal and the production of gaseous and solid smokeless fuels, as well as the recovery of by-products which were of value to the nation as the foundation of thousands of chemical substances which were essential for the manufacture of industrial chemicals and pharmaceutical requirements. The most modern drugs could not be produced if it were not for the hydrocarbons derived from coal. It was a vocation which had maintained its grip upon them all. The more the industry had been criticized by the uninformed public and, though he hesitated to say it, by the uninformed members of the daily Press, the more they had kept together, the more they had fought; and he thought that they had won through most of their difficulties.

The Gas Engineer's Responsibility

The gas engineer had been in the position of being a technical officer in charge of an undertaking which was often controlled by a non-technical body of directors or by a municipality. He was an officer

A group, taken at the works of Drakes, Ltd., including the Mayor of Halifax, Ald. Charles Holdsworth, J.P.; J. MacLusky, President of the Manchester and District Association of Gas Engineers; R. Kelf-Cohen, Ministry of Fuel and Power; Dryden Brook, M.P. for Halifax; John A. Drake, Managing Director of Drakes Ltd.; H. Singleton, Huddersfield; G. Currier, Bradford; N. Hudson, Mirfield; A. K. Collinge, Preston; T. Haworth, Hon. Secretary of the Association, Wigan; J. D. Ashworth, Blackburn; and D. T. Livesey, Doncaster.

The **Mayor of Halifax,** Alderman Charles Holdsworth, in responding to the toast, said that Halifax people were very proud of their town, and there was certainly plenty of organizations in it for visitors to admire. The Corporation purchased the gas undertaking in 1855, and had done everything in their power to promote its usefulness to the community. He was delighted to welcome the members of the Association to Halifax, and to pay tribute to their President, Mr. James MacLusky.

Mr. **R. Kelf-Cohen** (Under-Secretary and Director, Gas and Electricity Division, Ministry of Fuel and Power), in proposing the toast of "The Manchester District Association of Gas Engineers," mentioned that it was customary upon such occasions to say that it was a privilege and a pleasure to be invited to accept the responsibility of doing so. He did say so in all sincerity. The Association consisted mainly of gas engineers of the Lancashire and Yorkshire gas undertakings, and as he, personally, had been born in Yorkshire and brought up in Lancashire, he entertained great sympathy with the objects which the Association had set out to achieve. The Manchester District Association of Gas Engineers was an old organization and represented a large part of the gas industry. The name of Mr. James MacLusky, the President, was associated with the toast, and that name was highly honoured in the industry. Therefore it was appropriate the meeting should be convened in Halifax. It was pleasant to observe that although the Lancashire members appeared to compose two-thirds of the Association they were always prepared to go "evens" with Yorkshire, thus evincing a good and friendly spirit one towards the other.

The **President,** responding, said he was honoured to appear before the members in his Presidential capacity, wearing the badge of office which his late father wore before him. A gas engineer, he continued, who had to be trustworthy, to take care of very expensive plant; and he ventured to state the gas engineer had reacted well to that trust. He had developed initiative. The industry, as it stood now, nationally, was about 75% under company ownership, and only 25% under municipal control, but this did not affect the daily work of the gas engineer. Since 1870 the various Gas Associations had met in conference continually, because it was realized that gas engineers, in order to help themselves, their employers, and the community generally had to interchange knowledge, to state their experiences, and learn from both their mistakes and their successes. Therefore they had become brothers in the profession, and it was to be hoped they would always remain so. Any change of ownership would have to be very different from what they had known in the past in order to prevent them meeting together and rendering mutual assistance. In addition to being gas engineers they had also to be business men. Gas service was dependent on close contact with their friends, the gas consumers, whether such service was rendered in cities, in towns, or in villages. It was pleasing to learn that the Gas Bill did not envisage direct control from London, but that there were to be autonomous Area Boards which would function like large municipal undertakings or large companies. It was to be hoped that in the new scheme of things there would be decentralization so that each engineer would feel he had his own job to do, would have his own consumers, and his own works. If this was to be the case, then they would certainly continue to be as happy in their work as they had been in the past.

Alderman **W. Regan,** J.P. (Chairman, Halifax Corporation Light, Heat, and Power Committee), in proposing the toast of the guests, said that in Halifax they had always taken pride in the fact that many young men who had been trained by and had served with the Halifax Gas Undertaking now occupied positions of responsibility in the

industry. Continuing, Alderman Regan said he realized that his career of Chairman of the Halifax Corporation Light, Heat, and Power Committee would soon come to an end. He was very sorry for this since he had for 14 years served as Vice-Chairman and had only been its Chairman for two or three years. His politics, however, prompted him to state that he believed the nationalization of the industry would be a very fine thing not merely for the industry itself but also for the whole of the country. Boundaries of supply which had proved to be awkward or irksome would be swept away and planning would be possible on a much broader basis. It was to be hoped that the Consultative Councils which were being set up under the Gas Bill, shortly to become an Act, would enable men such as himself to continue to take an interest in gas supply, and to make representations to the Area Boards, and to the Gas Council, on matters which were considered to require attention. In Halifax they had piloted the gas undertaking through difficult times not only in the field of finance but also in the solution of highly technical matters. They were now satisfied that the undertaking, particularly when the new extension plans were completed, would be able to take its place as a gas manufacturing station in the new organization which was in contemplation. He was not despondent about the future of the gas industry, and he had always entertained a high regard for the professional skill and technical achievements of gas engineers. Halifax was very proud to find that their Gas Engineer had been elected to the high office of President of the Association, and particularly since his late father also, when he was their Gas Engineer, had occupied a similar position in 1929.

Mr. **L. P. Ingram** (President of the Southern Association of Gas Engineers), in acknowledging the toast, said that as an old student of Leeds University it was a real pleasure for him to return to Yorkshire, the county in which his first labours in the art of gas engineering were carried on, though, he would add, that he was going to visit Lancashire on the following day in order to preserve his neutrality. The great traditions of fellowship and service as evidenced by the Manchester and District Association of Gas Engineers and other kindred bodies throughout the country would continue whatever might be the offspring of the future. The Gas Bill was intended to make the industry a legitimate child, though by some it might be considered to be the love-child of socialist parents. It had been conceived by the Labour Government and its paternity must now be admitted, and he did not think there was any need to consider it as being anything except eugenically sound, whatever anyone might have to say upon the question of its maternal influences. It was a duty imposed upon all of them to see that the child was nursed to full health and strength. In conclusion, he expressed the hope that sometime in the future a visit might be paid to the South where the members of the Association would be most cordially welcomed.

Visit to Drakes, Ltd.

The members then visited the works of Messrs. Drakes, Ltd., at Ovenden, where they were welcomed by Mr. John A. Drake, Chairman and Managing Director of the Company. An interesting innovation to the visit was that the party were not conducted through the works in any formal manner, but inspected them at leisure of their own free will. A detailed description in each department was given over loudspeakers by Mr. John A. Drake, to the whole of the visitors *en-bloc*, instead of the usual method of being taken round in small parties by guides. This innovation ensured that all visitors received detailed information as to what was happening, and they saw demonstrations by various machines. This method of "guiding" proved a complete success. The technical staff of Messrs. Drakes, Ltd., mingled with the visitors and were able to answer individual questions.

Drakes, Ltd., are one of the oldest carbonizing firms in the industry, and are now in their 101st year. One of the most interesting departments inspected was the foundry, which has been mechanized for the speedier production of castings. It was stated that one of the greatest bottlenecks in the industry is the shortage of skilled moulders.

The sand plant was also of particular interest as the sand is mechanically handled continuously by elevators, band conveyors, skip hoist, and mixer. The girder shop is a modern building completed just before the outbreak of the 1939 war, and is laid out for the fabrication of steel work with the minimum of handling. It is complete with a loading bay for railway trucks.

A new boiler shop is in course of construction in order that an expansion can be made in the fitting shop and machine shop to facilitate a greater output from the works.

The members were subsequently entertained at tea in a marquee erected for the occasion.

Mr. **J. D. Ashworth** (Blackburn) proposed a vote of thanks to Messrs. Drakes for their invitation to visit the works and for their hospitality. This was seconded by Mr. **A. K. Collinge** (Preston), who heartily congratulated the firm on the success of their plant extensions and the mechanization of their foundry.

Mr. **John A. Drake,** in acknowledging the vote, said it was now 15 to 20 years since the Association had paid a previous visit to the works. Only the day previously he had been looking at the photograph which had been taken upon that occasion, and he could recognize some of the members as having been present then. It was to be hoped that within the next similar period of time further progress would be exhibited to the firm's visitors.

Parliamentary Notes

THE Member for Kingston asked the Prime Minister on June 22 what steps he was taking in order to establish Parliamentary control over the nationalized industries. The Prime Minister said that the basis of socialization legislation was that boards of competent persons should undertake the management of public-owned industries and services; the Member's assumptions of ministerial responsibility for matters of management were in conflict with decisions reached by Parliament. The Ministers of parent Departments had statutory responsibility for certain aspects of the work of the nationalized industries and were, therefore, answerable to Parliament on those matters.

Mr. Boyd-Carpenter then asked further if the answer meant that the Prime Minister was satisfied with the present position; and had he considered the effect on the prestige of the House of depriving it of control over large scale activities of bodies under public ownership.

Mr. Attlee: "The Government are carrying out the decision of the House of Commons in this matter. The decision was come to after full consideration."

Another Member asked Mr. Attlee if he was aware that a large number of people in the Labour movement were perturbed by the passing of power from the House to the Boards, in contrast to the method adopted for dealing with the Post Office.

The Prime Minister reiterated that the decision had been made by the House, and they would abide by those decisions.

The Member for Farnham then pointed out the fact that questions could be addressed to Ministers about almost every industry owned by a private firm, but not about industries owned by the people. Mr. Attlee said that he had never known that kind of question asked about a private firm, whereupon the Member asked the Prime Minister to keep an eye on the Order Paper.

Purchase Tax (Refunds)

The Member for Kingston asked the Chancellor of the Exchequer whether he had considered the representations made to him by the Kingston-upon-Thames Chamber of Commerce on the subject of the inability of traders to claim refunds of purchase tax on goods held in stock when purchase tax was officially withdrawn or reduced; and what action he proposed to take. Sir Stafford Cripps said, Yes, but there was no legal authority for refunding the tax and it would be impracticable to attempt to do so.

The Member stated that widespread hardship was caused by this and asked, if there was no legal authority, was he not contemplating some. The Chancellor replied: "No, Sir."

Electricity (Consultative Councils)

The Member for Reigate asked the Minister of Fuel and Power, on June 24, when the members of the Consultative Council under the Electricity Act for the South Eastern Region were to be appointed. Mr. Gaitskell said that he had already explained in answer to previous questions, that he had not yet received the final lists of names from all the organizations concerned. He added that the task of selecting between 280 and 420 members for 14 councils from among about 1,400 names would necessarily take time.

Public Corporations (Short Titles)

On June 29 the Member for Middlesborough asked the Prime Minister if he would take steps to ensure that the titles given to public statutory corporations would be so chosen that duplication of the initial letters by more than one such body, should be avoided. Mr. Attlee said that the point would be borne in mind. The short titles used by those bodies was a matter for their own discretion, and need not be identical with their full statutory designation.

The Member then recounted that confusion had been caused by the use of the initials B.E.A. both for British European Airways and the British Electricity Authority, and asked the Prime Minister if he could encourage one or other of the bodies to stop using the letters. Mr. Attlee said that the names either people or authorities were called, was a matter for them; he was sure that they would endeavour to avoid ambiguity; there was no need always to use initials.

Opencast Production

On July 1 the Member for Wallasey asked the Minister of Fuel and Power if the target mentioned in the Economic Survey for 1948 (amounting to 11 mill. tons) of opencast coal, had been amended; and the reason for the alteration. Mr. Robens, in a written reply, said that the target had not been changed, and that there were prospects of the target being exceeded. The Member for Edinburgh then asked if the House could have an estimate of the over-all cost of opencast coal per ton. The reply indicated that the cost was 43s. 2d. per ton on an average during the year ended Mar. 31, 1948.

DESIGN OF DISTRIBUTION SYSTEMS FOR "FULL DOMESTIC SERVICE"

By H. J. ESCREET, B.Sc.(Eng.), M.I.C.E., M.Inst.Gas E.

In Communication No. 337 of the Institution of Gas Engineers, presented to the Institution on June 9, 1948, Mr. Escreet divided his subject, "A Survey of Gas Distribution Practice," into two parts. The first gave the present state of the technique of distribution in this country. This part was a *précis* of published information. The second part, which we give here, is concerned with the design of distribution systems to supply gas for "whole house heating," the estimated consumption per consumer being 1,200 therms per annum.

"WHOLE house heating" is defined as the heating of a whole house to a predetermined degree for the whole of the time, with the occupied rooms raised to a higher temperature when desired.

In this example it is assumed that all rooms are maintained at a temperature not less than 55° F. day and night, that the living-room and dining-recess are heated to 65° F. for 15 hours per day, and the kitchen, bedrooms, and bathroom are heated to 65° F. for four hours per day.

The maximum hourly demand is estimated at 0.35 therm with an outdoor temperature of 37° F., the minimum average weekly temperature for the Midland Counties (1881 to 1915), and at 0.5 therm if the outdoor temperatures fall to 25° F., including 0.13 therm for cooking, water heating, and refrigeration. These figures were supplied to the author by Dr. H. Hartley.

Calculations are made of the sizes of mains which would be required for local distribution if the above loads were to be supplied. If

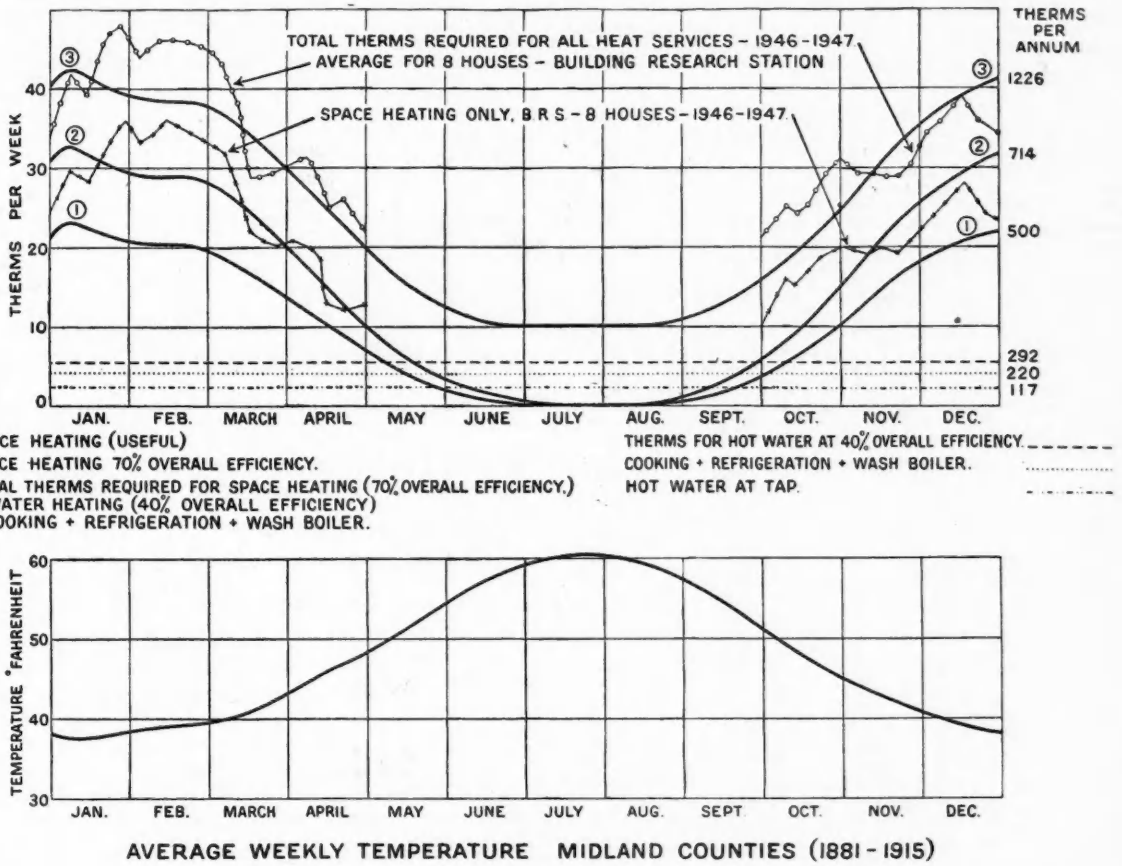
TOTAL THERMS REQUIRED FOR ALL HEAT SERVICES – 1946-1947
AVERAGE FOR 8 HOUSES – BUILDING RESEARCH STATION
SPACE HEATING ONLY, B R S – 8 HOUSES – 1946-1947
THERMS PER WEEK
THERMS PER ANNUM
1226
714
500
292
220
117
JAN. FEB. MARCH APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
① SPACE HEATING (USEFUL)
② SPACE HEATING 70% OVERALL EFFICIENCY.
③ TOTAL THERMS REQUIRED FOR SPACE HEATING (70% OVERALL EFFICIENCY.) + WATER HEATING (40% OVERALL EFFICIENCY) + COOKING + REFRIGERATION + WASH BOILER.
THERMS FOR HOT WATER AT 40% OVERALL EFFICIENCY.
COOKING + REFRIGERATION + WASH BOILER.
HOT WATER AT TAP.
TEMPERATURE °FAHRENHEIT
AVERAGE WEEKLY TEMPERATURE MIDLAND COUNTIES (1881-1915)

FIGURE 1.—*Whole House Heating.—Thermal Inputs Required for Various Heat Services.*

The total annual consumption for full domestic service by gas for a moderately well insulated* house, of 950 sq. ft. area and with a heating installation of the warm-air type, is estimated at 1,226 therms per house. A graph (Fig. 1) shows the variation of load throughout the year for a typical "full domestic service" consumer.

every house in a district were equipped only for heating by gas it would appear that the load would depend almost wholly on the outdoor temperature, and little diversity could be expected as between one house and another. Diversity would still apply to cooking and water heating, and this is taken into account in the peak-hour demand of 0.13 therm per consumer. Experience on the Gas Light and Coke Company's area shows that the maximum short-period demand with the existing type of load, which includes some space heating, may reach 20 to 23 cu.ft. per hour (0.1 to 0.115 therm of 500 B.Th.U. per cu.ft. gas) on relatively small groups of houses, although it is probably less than 15 cu.ft. per hour for large districts. Figures of

* The insulation standard adopted for the calculations conformed with that recommended in Post-war Buildings Studies No. 19—Heating and Ventilation of Dwellings. The thermal transmittance values were:
Outside walls, 0.2 B.Th.U. per sq. ft. per hour per °F.
Ground floor, 0.15 B.Th.U. per sq. ft. per hour per °F.
Roof and top ceiling, 0.17 B.Th.U. per sq. ft. per hour per °F.
An allowance was made for two air changes per hour.

19 to 21 cu.ft. per hour for the maximum rate during 10 minutes were given by C. H. Chester in 1945. The estimate of 0.13 therm is therefore on the high side, and if mains are provided to deal with the total of 0.5 therm there should be no difficulty in meeting the maximum demand. The lower figure of 0.35 therm, corresponding to outdoor temperatures of 37° F., would only be sufficient if either the consumers were prepared to tolerate lower house temperatures in extreme weather conditions, or one or more solid-fuel fires were provided for topping up. However, the author is only concerned with the distribution problem, and figures will be given for maximum loads of 100 cu.ft. per hour per house, and 70 cu. ft. per hour per house, corresponding to the above demands when the gas has a calorific value of 500 B.Th.U. per cu.ft., leaving it to others to decide how these should be applied in practice.

In order to produce comparable schemes of distribution for these various demands it is desirable to reduce the distribution system to a simple form. A distribution centre to every 2 sq. miles, or 1½ miles between centres, provides satisfactory pressures for present loads and a simple distribution unit, 1½ miles square (*i.e.*, 2¼ sq. miles in area) has been devised.

The area is laid out diagrammatically with roads in squares of sides, 1½ miles, 1¼ miles, 1 mile, &c., and with eight main roads radiating from the centre. It is assumed that the distribution centre is at the centre of the square, and trunk mains are laid from it along the radial roads feeding the street mains along each square of roads. Each trunk main will feed half way to the next trunk main along each of the street mains. Although this type of road layout may appear to be diagrammatic only, the following calculations show that it is a practicable plan.

(*a*) Allowing eight houses to the acre, the total number of houses per square mile would be 5,120. For the whole distribution unit of about 2 sq. miles, a figure of 10,000 houses may be taken.

(*b*) Allowing a frontage of 30 ft. per house, and houses on both sides of the road, the total length of road would be 10,000/2 × 10 yd. = 50,000 yd., or 28.4 miles.

Worked out diagrammatically 28¼ miles of road are on the diagram, of which 21 miles are on the squares and 7¼ miles on the radial roads.

Calculation of Sizes of Mains

The sizes of the street mains required for the supply of the distribution unit have been calculated on the basis described in the section headed " Local Distribution " in the paper on " The Design of Distribution Systems to Supply Post-war Development " which the author presented to the Institution in 1943, the maximum length of mains of various sizes which can be used for a pressure drop of 1 in. W.G. (low pressure) or 4 lb. per sq. in. (intermediate pressure) being calculated, and the appropriate size chosen to fit the length of street to be supplied.

The size of the trunk mains along the radial roads has been calculated by taking into account the volume of gas to be supplied to each of the street mains and the distances over whith this gas has to be conveyed, allowing a pressure loss of about 2 in. W.G. for the low-pressure system, or 5 lb. per sq. in. for the intermediate-pressure system.

Layout of Distribution Unit for Normal Demands

Applying the method to the calculation of sizes of mains for the distribution unit when supplying a normal maximum demand of 20 cu.ft. per hour, it will be found that 4 in. mains would be adequate for all the street mains, and 10 in. mains would be required for the trunk mains. The service pipes would be 40 ft. in length and of 1 in. diameter.

An alternative layout, as now adopted by many undertakings, would provide for duplicate mains in every street, and additional mains along the trunk roads, so that all mains and services would be in the footways, and service pipes crossing the carriageways would be avoided. All the additional mains would be 4 in. diameter, and the services would be shortened to 25 ft.

Table 1 following shows the sizes and lengths of mains and costs of mains and services required for these two layouts, and also shows for comparison the sizes, lengths, and costs of main, for part of the Becontree estate. The estate had an area of 5 sq. miles and comprised 25,000 houses. For comparison with the " distribution unit " two-fifths of the actual mileage of mains has been taken, and the costs have been brought up to the 1948 price levels. The annual consumption per consumer has been taken at 150 therms, and the annual charges for mains and services have been taken at 8% on the capital value.

TABLE 1.—*Sizes of Mains and Cost of Mains, Services, &c., for Maximum Demand of 20 cu.ft. per house*

	Single mains	Duplicate mains	Becontree Estate (part of)
Sizes of mains (in.) ...	4 10	4 10	4 6 8 12
Length (miles)	21 7¼	49¼ 7¼	20 12 2¼ 3¼
	£	£	£
Cost of mains	87,505	155,870	170,000
Cost of services	50,000	32,500	40,000
Total cost	137,505	188,370	210,000
Annual charge per therm	1.76d.	2.41d.	2.7d.

It will be seen from Table 1 that the total length of mains on the Becontree estate is 38 miles, compared with 28¼ miles for the single-main system, and 56½ miles for the duplicate-mains system. Actually there are a number of wide roads on that estate, and a proportion of the mains were laid in duplicate; also, the square layout of the distribution unit is more economical of mains than most actual estate layouts. It is considered, however, that the comparison in Table 1 is sufficiently close to justify using the diagrammatic layout as a typical system for estimating the size of mains for various demands.

Layout of Distribution Unit for Full Domestic Service

A summary of sizes and costs of mains and services for supplying maximum demands of 70 cu.ft. per hour and 100 cu.ft. per hour, both at low pressure and intermediate pressure, is given in Tables 2 and 3. Table 2 is for single mains and 40 ft. services, while in Table 3 are given summaries for layouts using duplicate mains and 25 ft. services.

The annual consumption per consumer is taken as 1,200 therms in both cases because the full demand of 100 cu.ft. per hour is only likely to occur on very few days per year and would not materially affect the annual consumption.

TABLE 2.—*Sizes of Mains, Cost of Mains, Services, &c., for Maximum Demands of 70 cu.ft. and 100 cu.ft. per hour (Single Mains)*

Type of system	Low pressure		Intermediate pressure	
Maximum demand	70 cu.ft. per hour	100 cu.ft. per hour	70 cu.ft. per hour	100 cu.ft. per hour
Sizes of street mains (in.) ...	6 4	8 6 4	3 2	3 2
Lengths (miles)	15 6	6 12 3	6 15	11 10
Size of trunk mains (in.) ...	15	18	6	8
Length (miles)	7¼	7¼	7¼	7¼
	£	£	£	£
Cost of mains	127,820	161,260	65,120	73,700
Cost of services	50,000	50,000	70,000	70,000
Cost of governors	—	—	25,000	25,000
Total cost	177,820	211,260	160,120	168,700
Annual charge per therm ...	0.28d.	0.34d.	0.26d.	0.27d.

TABLE 3.—*Sizes of Mains, Cost of Mains, Services, &c., for Maximum Demands of 70 cu.ft. and 100 cu.ft. per hour (Duplicate Mains)*

Type of system	Low pressure		Intermediate pressure	
Maximum demand	70 cu.ft. per hour	100 cu.ft. per hour	70 cu.ft. per hour	100 cu.ft. per hour
Sizes of street mains (in.) ...	6 4	6 4	2	2
Lengths (miles)	12 37¼*	22 27¼*	49¼*	49¼*
Sizes of trunk mains (in.) ...	15	18	6	8
Length (miles)	7¼	7¼	7¼	7¼
	£	£	£	£
Cost of mains	193,545	227,865	112,200	118,580
Cost of services	32,500	32,500	52,500	52,500
Cost of governors	—	—	25,000	25,000
Total cost	226,045	260,365	189,700	196,080
Annual charge per therm ...	0.36d.	0.42d.	0.30d.	0.31d.

* 7¼ miles additional main required for the duplicate mains on the line of trunk mains.

Alternative System for Maximum Demand of 100 cu. ft. per Hour

The layouts given in Tables 2 and 3 refer to supply either wholly at low pressure or wholly at intermediate pressure. Another method worth considering is the use of low pressure for the street mains and intermediate pressure for the trunk mains, with governors at every junction between trunk and street mains. In this case a higher pressure loss in the street mains could be allowed, and the size of main shown in Table 2 for 70 cu.ft. per hour could be used for 100 cu.ft. per hour. A pressure of 2 lb. per sq. in. would be required at the distributing centre.

The costs of such a system (single mains) would be:

	£
Street mains, as in Table 2	64,020
Trunk mains (10 in. diameter)	36,685
Additional 4 in. mains to supply trunk roads	17,545
Governors—	
8 × 8 in. at £300	
24 × 6 in. at £200	9,600
16 × 4 in. at £150	
Services	50,000
Total	177,850
Annual charge per therm	0.28d.

Conversion of " Normal " Distribution Systems to Provide for Full Domestic Service

So far consideration has been confined to the provision of mains for a new " ditribution unit " for supplying full domestic service, but it is of interest to consider how an existing system, laid out for supply of normal loads, might be converted to a system of full domestic service.

The simplest method of conversion would appear to be to fit service governors on every supply, and operate the whole system at intermediate pressures. The installation of service governors on existing supplies would be more expensive than the inclusion of such governors on the original service, and it would also be necessary to fix a control

cock on the service close to the main. An allowance of £5 10s. per supply would probably cover these charges, making a total conversion charge for the whole distribution unit of £55,000. Adding the original cost of £137,505 (single-main system; Table 1) the total cost would be £192,505. The annual charge per therm would be 0.31d. A pressure of 5 lb. per sq. in. would be required at the distributing centre.

Should it be thought inadvisable to operate the whole of the existing mains system at intermediate pressure the increased demand might be met by converting the trunk mains to intermediate pressure, installing governors to supply the street mains as detailed at the end of the preceding sub-section, and laying additional mains in the longer streets to keep the pressure losses along the streets to a reasonable figure. Service governors would also be required for the houses supplied direct from the trunk mains. A pressure of 2 lb. per sq. in. would be required at the distributing centre.

The additional cost, assuming the original system to be single mains, would be:

	£
Additional street mains—	
12 miles × 4 in. } 6 miles × 6 in. }	64,680*
Governors to feed street mains	9,600
Service governors	14,000
	88,280
Original cost of system	137,505
Total	225,785
Annual charge per therm	0.36d.

* Allowing for reinstatement of paving.

Costs of Transmission

The foregoing costs have referred only to local distribution, and it is necessary also to consider the costs of transmission of gas from the manufacturing station to the distributing centre. This is particularly important when comparing the costs of low-pressure and intermediate-pressure distribution, because the pressure of 11 lb. per sq. in. required at the distributing centre for the latter system materially affects the cost of transmission.

To avoid complicating the issue, transmission costs have only been calculated for a distance of 10 miles. It is unlikely that a supply to a single distributing centre would be given at a greater distance from the manufacturing station than 10 miles.

Table 4 gives details of the most economic size of main and initial pressure for hourly rates of 700,000 cu.ft. and 1 mill. cu.ft., corresponding to the peak demands of 70 cu.ft. and 100 cu.ft. per consumers and for terminal pressures of 1 lb. per sq. in. and 11 lb. per sq. in., for low-pressure and intermediate-pressure distribution. Figures are also given for (*a*) a rate of 200,000 cu.ft. per hour, corresponding to the "normal" maximum consumption of 20 cu.ft. per consumer, for a terminal pressure of 1 lb. per sq., and (*b*) 1 mill. cu.ft. per hour for a terminal pressure of 2 lb. per sq. in.—this referring to the schemes for intermediate-pressure trunk mains and low-pressure street mains.

TABLE 4.—*Transmission Costs for* 10 *miles*

Volume (cu.ft. per hour) ...	200,000	700,000		1,000,000		
Terminal pressure (lb. per sq. in.)	1	1	11	1	2	11
Size of main (in.)	18	30	24	30	30	30
Initial pressure (lb. per sq. in.)	3.2	3.0	14.5	4.6	5.5	13.3
Annual charge (pence per therm)—						
Main	1.58	0.45	0.31	0.45	0.45	0.45
Pumping	0.63	0.24	0.76	0.46	0.53	0.96
Total	2.21	0.69	1.07	0.91	0.98	1.41

It will be seen that the economic initial pressures for the terminal pressure of 1 lb. per sq. in. are low, and consequently the provision of the high terminal pressure required for intermediate-pressure distribution adds considerably to the pumping costs per therm.

Summary of Costs

In Table 5 the annual charges per therm for local distribution and transmission have been brought together so that the total cost of the mains systems considered above can be compared.

The principal conclusions to be drawn from Table 5 are:

(*a*) The costs per therm for distribution of gas for full domestic service are less than one-third of those for normal distribution.

(*b*) For these large loads distribution at intermediate pressures in the range 5 to 10 lb. per sq. in. is more expensive than low-pressure distribution.

(*c*) Restriction of demand to 70 cu.ft. per hour results in a saving of about ¼d. per therm in the costs of supply of full domestic service.

(*d*) An existing low-pressure system could be converted to carry the load of full domestic service without any great difficulty and the costs of local distribution would only be a little higher than for a system specially designed for that purpose, but the extra pumping cost of transmitting five times the volume of gas would be high. Even so, the total cost of 2.17d. per therm is only about half the cost for the "normal" load.

The lower cost for full domestic service, compared with normal supply, is partly owing to the better load factor. The ratio of $\frac{\text{maximum hours demand}}{\text{annual consumption}}$ is only $\frac{1}{3,400}$ to $\frac{1}{2,400}$ for full domestic service, while for normal supply it varies from $\frac{1}{2,000}$ to $\frac{1}{1,500}$ and partly because the cost of the main per unit of capacity decreases as the size of the main increases. For practical reasons the minimum size of main used by most undertakings is 4 in. diameter, and frequently these are laid in duplicate; the mains capacity is therefore often in excess of actual requirements, and the cost per therm delivered is unduly high.

It should be emphasized that the costs quoted are based on the very high annual consumption of 1,200 therms for every consumer, and that this consumption is largely accounted for by the high standard of "whole house heating" which has been assumed. The heating of the whole house day and night for some nine months of the year gives a very different form of load distribution from that of the normal type of space heating by gas in this country.

TABLE 5.—*Total Annual Charge per Therm for Distribution*

Maximum hourly demand per House	Normal load 20 cu.ft.						Full domestic service 70 cu.ft.						100 cu.ft.					
Type of local distribution ...	Single main			Duplicate mains			Single main			Duplicate mains			Single main			Duplicate mains		
	a*	b*	c*	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
Low pressure	1.76	2.21	3.97	2.41	2.21	4.62	0.28	0.69	0.97	0.36	0.69	1.05	0.34	0.91	1.25	0.42	0.91	1.33
Intermediate pressure							0.26	1.07	1.33	0.30	1.07	1.37	0.27	1.41	1.68	0.31	1.41	1.72
Low-pressure street mains and intermediate-pressure trunk mains													0.28	0.98	1.26			
Low-pressure system converted to intermediate pressure ...													0.31	1.83	2.14	The high transmission cost is due to the use of the existing 18 in. main for a rate of 1 mill. cu.ft. per hour		
Low-pressure system with additional street mains and intermediate-pressure trunk mains													0.36	1.81	2.17			

* Annual Charge (pence per therm) { a = Local mains. b = Transmission. c = Total.

The author is very doubtful whether "whole house heating" could be developed on such a large scale as has been envisaged in the calculations made above, but even if the costs of distribution could be so reduced by the development of this load, these costs would be only a part (probably a small part) of the total costs of supplying full domestic service, and the effects of such concentrated loads, varying very quickly with atmospheric temperature, upon the costs of manufacture of gas would require very careful consideration before the industry could decide to encourage "full domestic service" on a large scale.

DISCUSSION

Mr. C. H. Chester (Swindon) said he was particularly glad that the author had stressed the importance of even loading and of a good load factor which in turn levelled out the load at manufacturing stations. With the high cost of main laying which prevailed, it was all the more essential that they should obtain the utmost efficiency and economy from their present systems, and the author had shown them how they might be improved. The Gas Light and Coke Company's grid was based on Beckton as the principal centre of supply. It was the largest in the country and had enabled the levelling out of the load on that manufacturing station to an amazing extent. When the total output from Beckton was 83 mill. cu.ft., the variation in stock at that station during the 24 hours was less than 2.5 mill. cu.ft. What purpose were all the Beckton holders serving? Could not the engineers at that station work quite comfortably with only a fraction of the holder accommodation they now had? Gasholders were unprofitable plant. They were large ungainly things which needed a lot of painting and which nobody, and least of all the modern town planner, liked. At Swindon, by dotting holders at inconspicuous places at the extremities of the high pressure mains, they had been able to work with considerably less holder storage at the main Swindon Works than was normal. The accommodation was in fact only 2.4 mill. cu.ft., and of that only 1.3 mill. was effective for low pressure distribution out of the total maximum load of 6 mill. cu.ft. per day. The Swindon high pressure system had enabled them to level out the load. In 1931 the gas which was sent out between the hours of midnight and 6 a.m.

represented approximately 4% of the daily load. By 1943 the figure had increased to 15%. Unfortunately, with the lack of development occasioned by the war, the figure had now fallen to 12%, but three additional small holders were in course of construction, all of which were to be placed at extremities of the high pressure mains.

Mr. Escreet had compared Swindon's distribution system with the four largest, most highly concentrated, and efficient systems in the country. The difference between the three systems was more apparent when figures which Mr. Escreet has not quoted were produced. Let them take the number of consumers per square mile. For the Gas Light and Coke Company's area the figure was approximately 2,790, for Birmingham 1,729, and for Swindon 79. Let them take secondly mill. cu.ft. sold annually per mile of main; for Gas Light and Coke Company 8.85, for Birmingham 10.35, and for Swindon 4.94. Lastly, let them take consumers per mile of main; for Gas Light and Coke Company 240, for Birmingham 160, and for Swindon 79. The statutory area of the Swindon Company, which was predominantly rural, was larger than the Gas Light and Coke Company's area. Yet the average cost of gas to the domestic consumer in those larger areas varied very little from the truly rural area at Swindon. This must be a pointer to wider integration over greater distances and more development of rural gas supplies. The maximum short period demand per consumer over the whole of the Swindon area was 19 to 21 cu.ft. per hour. He could not reconcile that figure with the comparatively low figure of less than 15 cu.ft. per hour for large districts quoted by Mr. Escreet.

The author had given them details of a theoretical distribution system designed for " whole house " heating, as well as for cooking, water heating, and refrigeration. He (Mr. Chester) found it a little difficult to believe that in the present economic condition of the country those loads would ever prevail, but the system formed a most interesting study. He would like to ask the author whether he was aware of any satisfactory method of spot metering of trunk mains at peak load. Frequently they were asked to provide mains to new housing estates which lay wholly or partly within a present system and they then had the task of deciding whether the existing mains, which were hopelessly interlinked, were adequate to carry the additional load, or whether they would need some support from high pressure mains. In these cases it would appear that to be able to produce a peak hour flow diagram with all peak hour flows indicated for all the trunk mains would be desirable. He thought some need existed for a simple device which could be transported to the site and a reading taken at any time without resorting to fixed orifice plates or other recognized forms of metering.

Steel and C.I. Mains

He was interested to learn that most of the consumers on the Grays high pressure system were fed through 2 in. branch mains and that the total gas supplied through this system in 1947 was 5 mill. therms. Mr. Escreet had told them that steel pipes were not so suitable as cast iron pipes because services were not so readily connected, because of the thinness of the walls and because of the corrosion factor. He (the speaker) thought it was generally accepted that for practical reasons the minimum size of cast iron main laid by most undertakings was 4 in. diameter, and it would be interesting to learn whether the 2 in. mains at Grays, through which most of the consumers were supplied, were in steel or cast iron. Did he not think there was room for an alternative to either the 2 in. steel main or the 4 in. cast iron main? Frequently they had to install 4 in. cast iron mains for short branches off larger sized high pressure mains merely to cater for a dozen houses or so situated off the line of the main. He felt there was room for a 2 in. cast iron main for high pressure, but the practical difficulties of tapping together with physical strength of such a small main had not been overcome.

He found the suggestion novel of meeting the maximum demand in cold weather by installing peak load manufacturing plant at or near the end of the principal grid main, so that at such times the additional gas could be made where it was required for use, and the main system thereby relieved of the peak demand. He envisaged many difficulties in this suggestion, but further investigation must be well worth while.

Feeder Mains and Grids

Mr. **F. L. Atkin** (Birmingham) remarked that the author had referred to feeder mains supplying local low pressure systems through district governors, a system developed extensively in Birmingham where, during peak periods, more than 50% of the gas passed through this system. It was stated that one governor per 2 sq. miles with 1½ miles between governors was satisfactory, the local mains system being 12 in. to 4 in. diameter. The Birmingham system was laid out on a larger scale, each governor supplying an area of nearly 5 sq. miles with mains from 24 in. to 12 in., the object being to design the outlet mains so that the gas might pass outwards away from the gas-works, which were situated near the centre of the city. Such a system employed fewer larger governing units housed in buildings adjacent to the highway, and although the cost was greater the advantages were that maintenance and attendance were much easier than with underground governors.

The author had, with a certain amount of justification, attempted to draw a distinction between feeder mains and grids, but obviously there was no exact line of demarcation. A grid was a system supplying gas at a rate which did not depend on the hourly demand, whereas a feeder main system supplied the gas required to top-up the base load supplied by the low-pressure mains, and therefore the load on the feeder mains was proportioned to the hourly demand. If this was accepted it followed that grid systems should not be called upon to supply ordinary consumers, a point which he was pleased to note was taken care of in the Gas Bill.

The comparative sizes of the two areas of Birmingham and Swindon were interesting, but the output of 100 mill. therms of gas supplied by Birmingham included bulk supplies afforded to Smethwick, Dudley, West Bromwich, Oldbury, and Bromsgrove. Therefore, the actual area supplied with gas was greater than that indicated in the paper. Also as indicated in the paper the Birmingham area was somewhat overshadowed by the Swindon area, but the gas supplied by Birmingham was 18 times greater than Swindon, which showed the difference between a highly developed industrial area and an area which contained a large rural population.

High Pressure Holders

With reference to high pressure holder installations, he had two points to raise. The first related to the availability of off-peak pumping hours and the frequency of peak-load demands, which determined the compressor capacity. A proposed installation in an expanding area, with a superimposed and growing industrial load, needed careful consideration. Obviously the base loads would increase, creating restriction of off-peak availability, thus unbalancing the ratio of compressor capacity to holder storage, a condition applying especially in the winter time, when the need for pressure reinforcements was most desirable. A temporary relief could be obtained by the installation of larger compressors, but a point might be reached when it would have been better to have solved the problem finally by the laying of a high pressure feeder main. The adoption of whole house heating and its impact on the distributory system would immediately bring such considerations forward, and in many cases existing high-pressure storage stations would become outmoded.

The second point was that an installation of high pressure holders would not put right an overworked and faulty distribution system. A high pressure holder was capable of giving a high rate of back feed, but this was of no value unless the local mains could dispose of such quantities. This applied particularly to high pressure holders installed at the extremities of low pressure distribution systems. Consequently it should be borne in mind that it might be necessary to carry out extensive mainlaying in the vicinity of the holder station. From this point of view the reinforcement of the extremities of high pressure feeder mains by means of high pressure storage possessed distinct advantages.

Super High-Pressure Holder

With reference to the relation between the capacity and pressure of storage holders, a strong case could be made out for the small super high pressure holder—*i.e.*, 200 lb. per sq. in. Such holders could be factory made with Class 1 welding, the limitation being the stress-relieving capacity at the factory and transport to site. Such a holder would have a high degree of flexibility and, moreover, possess a certain amount of mobility. Holder stations could be installed in successive units as a temporary measure and then transferred to a more remote point.

With reference to laying mains in built-up areas, it must be agreed that mechanical excavating was almost impossible, but as an illustration of what could be done without such aids, 604 yards of 12 in. main had been laid in one 47-hour working week by 40 men, in the grass verge of a trunk road.

Purging of Mains

An interesting point had been raised in connexion with the purging of gas mains. When they were clearing a length of dead main, 12 in. diameter and 7 miles long, this was done very slowly over two days with perfect results. It was obvious that the gas was moving the air slowly forward in a column without too much intermixing, which was proved by tests taken at the syphons, the change from air to gas being clearly marked by both gas tests and audibility.

Holders in Outlying Districts

Lieut.-Colonel **J. A. Gould,** M.C. (South Suburban Gas Company), remarked that the author had drawn attention to the difficulties likely to be increasingly experienced in the future in securing powers to erect gasholders in outlying districts unless these were of no great height and could be effectively screened by trees. The greatest height his Company could get local authorities to agree to in 1935 when securing holder sites so screened was 75 ft., and with the greater emphasis on town planning nowadays, the limit would undoubtedly be very much less, necessitating the employment of high pressure holders.

The South Counties Gas Company of California had recently constructed unique holder installations each of 250,000 cu.ft. capacity at two points on its system. These holders consisted of lengths of 30 in. steel pipe similar to that used for the " Biggest Inch " Californian pipeline. One installation consisted of seven tubes 240 ft. long, and

the other of nine tubes 180 ft. long. These tubes were formed from factory-made lengths of approximately 60 ft. long, each 60 ft. length being made up of two 30 ft. lengths, each of which was rolled from a single $\frac{7}{16}$ in. plate.

The tubes were placed underground, surrounded with sand, which extended to 6 in. over them, and was surmounted by an 18 in. layer of soil. They were connected by 2 in. pipes to a 4 in. header and operated at a pressure of between 440 and 10 lb. per sq. in., the equivalent storage capacity being approximately 250,000 cu.ft. It was claimed that the ground over them could be used for the purpose of storing pipes, parking vehicles, &c. As the tubes were enamelled and wrapped and cathodically protected, it was not anticipated that maintenance costs would be appreciable. From cost comparisons stated, it was claimed the capital costs per 1,000 cu.ft. capacity were substantially less than those of other types of high pressure and water-sealed holders, the annual operating costs also being very much lower. The maximum operating pressure for the new holders was governed by the thickness of the plates which were available.

In regard to the author's remarks about pipe joints, he would urge the desirability of there being a British Standard flexible pipe joint; and he had already recommended this to the British Standards Institution. In his opinion it should be preferably one in which the rubber jointing ring was subjected only to compression stress axially applied. The joint should require only a spanner to tighten it up. There were many pipe foundries in the U.S.A. making a standard pipe joint of the kind referred to, sponsored by the Cast Iron Pipe Research Association. At present there were several standards in Great Britain. Metal spun pipes could have outside diameters varying according to the wear of the moulds in which they were spun from plus 0.08 in. to minus 0.08 in. (B.S.1211), whereas the tolerance on pit cast pipes was only plus or minus 0.06 in. (B.S.78). This made it desirable that the dimensions of, and tolerances on, flexible joint pipe sockets should be standardized.

In respect of the external protection of steel mains, he thought that existing methods left room for improvement, and that some coating offering protection equal to, say, $\frac{3}{8}$ in. of bitumen but more resistant to mechanical damage was necessary. Perhaps in due course the Gas Research Board might be able to give some attention to this important matter.

In regard to the use of copper tubing for service work, the cost of this was twice that of Grade C steel tubing. He agreed that copper services should normally cost less for maintenance purposes than those of steel, and would be useful in thrust boring jobs.

Mechanical Excavators

With mechanical excavators the trench had to be excavated to its full depth before the timber could be inserted. Hence their use in bad ground was inadvisable and might be dangerous. When laying 4 in. or 6 in. mains at normal depths in paved roads there was little saving in their use. They had considerable value in cross-country work. So far as their use for common trenches for estate mains was concerned, due to the different depths at which the various utility mains were laid, it was generally only desirable for a common trench to be taken out to the level of the shallowest main (usually the electricity cable), leaving the other utilities to deepen the trench to their required depths and to take out their joint holes.

Balancing Production Plants

Mr. W. **J. Hodkinson** (United Kingdom Gas Corporation, Ltd.) remarked that the author had outlined the development of grid systems in this country. Unfortunately it was now clear that present-day capital and power costs would seriously affect the future development of long-distance gas transmission in this country. He believed, however, that under certain conditions of load distribution about a given area, and by a balanced selection of production plants in the area, inter-connecting mains or local grid systems could play a useful part, yielding substantial economic benefits, by facilitating the control of production load factor to best advantage. The Gas Light and Coke Company's system would appear to function on these lines. The development of the line to Southend might also have this function in view as the balancing factor of the summer season peak at the resort might be used to advantage. The subject of control equipment as applied to grid systems and to distribution networks generally was of interest to them all, and the developments of the past three years offered unlimited scope. It was now possible to control every function of flow, pressure, and storage about a system from any one or number of pre-selected points at a known cost. The problem had become one of simple economics and a matter of determining the extent of the control required within the limits of economy. The grave danger lay in the ease with which such systems could become the master rather than the slave by over-elaboration and a disregard for the economic advantages sought by their use.

Under the heading of "Pumping Plant," Mr. Escreet had dealt with one of the most important features of design applicable to district and grid pressure systems—the compressor load factor. All too often one saw enormous pumping units operating for the greater part of the year at ridiculously low load factors, and it was obvious that even now it was not generally appreciated that it was economic to spend relatively large capital sums on a number of units rather than one unit for a given maximum load, thereby achieving substantial economies in power costs by the use of combinations of smaller units at the lower loads. He emphasized the author's viewpoint that it was dangerous to underestimate the importance of a gas pumping problem. It was undoubtedly a specialist subject calling for a most detailed examination of the requirements of each problem.

Full Domestic Service

In dealing with the hypothetical problem of distribution systems for a full domestic gas service, Mr. Escreet has developed his theme in a most ingenious manner. The survey clearly revealed the importance of annual consumption per domestic consumer upon present-day costs of mains and services, and served to show the problem which would face them when they came to consider the economies of supply to some of the satellite towns now being planned in various parts of the country. If they took the case of an estate of 10,000 houses at a distance of 10 miles from the point of manufacture, with duplicate mains system, the total annual capital charges for estate mains and transmission mains amounted to no less than 4.62d. per therm on the basis of a domestic consumption of 150 therms per consumer per annum. This figure might be improved somewhat by the incidence of commercial loads which would accrue from hotels, shops, and other services which would probably develop on such a site, but it was extremely doubtful whether the improvement would be such as to reduce the figure to an economic level.

The development of a full domestic heating service materially assisted this figure, but he joined with the author in sounding a warning note as to the effect of this load upon the incidence of other costs and particularly upon the cost of manufacture.

Economies First !

Mr. **Frederick Bell** (Liverpool Gas Company) said he had felt for some time that there was a tendency in the gas industry to consider that high pressure distribution was modern, but no system should be considered if it was uneconomic. This trend towards the use of high pressures might have been due to lack of capital, since small mains at high pressures involved a lower initial capital outlay. He felt that in future integration schemes where, in general, the distance covered would not be great, they should lay their mains in the larger sizes to keep their pressures as low as economically possible. He thought they should make more and more use of centralized distribution control, not only from the point of distribution pressures, stocks, and flows, but also from the manufacturing standpoint. With careful control many manufacturing centres could be worked on base-load production for many months — and possibly years — at a time, with a consequent cut in gas manufacturing costs, and then the load variations could be taken up at a minimum of manufacturing points, the gas being moved at pre-determined constant rates of flow throughout the interconnecting grid mains. In this connexion, it would be necessary to maintain adequate storage throughout the grid system and to take gas into or out of the holders as the load on the grid or the feeder system demanded.

In regard to "all-house heating," the author's conclusions were that the most economic method of attaining this end was to lay mains to the housing estate capable of carrying gas at intermediate high pressure and to fix governors at the necessary points throughout the estate to govern gas into the low pressure system. He (Mr. Bell) was, however, surprised to see that the author would suggest laying 2 in. mains for use with intermediate high pressure gas. He was of opinion that 2 in. mains, even when using intermediate high pressure gas, were a source of trouble from the point of service connexions, lower mechanical strength, and the ease with which corrosion could so quickly reduce their carrying capacity. He would strongly recommend, therefore, even in view of the increased capital cost, that no mains be of less than 4 in.

The approach to the question of an all-gas service was, from a hypothetical standpoint, most interesting, and, with a limited application on a small number of estates, it would be practicable; but surely the author was not suggesting that this could be applied nationally, since the gas industry at the moment was carbonizing about 20 mill. tons of coal per year, against the total mined coal of some 200 mill. tons. To increase the deliveries ten-fold would mean that they would have to carbonize over 200 mill. tons of coal—equal to the total mined output. Yet Dr. King informed them that only some 60 mill. tons per year was suitable for carbonization. Alternatively, total gasification would partially solve the problem, but Messrs. Finlayson and Townend did not envisage this process producing gas substantially cheaper than that obtained by normal carbonizing methods.

Mr. **W. K. Tate** (Portsmouth) said he had found the comparative practices adopted by undertakings in evolving their bulk gas distribution networks most interesting, although clearly both the geography and the development of the areas concerned had played a large part in the design finally adopted. His own preference, if only because of the ever-present possibility of further growth of demand between points of present consumption, was for the medium pressure system, utilizing initial pressures of up to 5 lb. per sq. in., but with all pipelines laid and tested to operate eventually at 30 lb. per sq. in. if required, and feeding or terminating in low pressure holders of substantial dimensions. While the high pressure holder had all the advantages

claimed in the paper, it lacked flexibility, particularly if left unattended and filling automatically at predetermined intervals. If it was attended, then some of its advantages disappeared.

Use of Storage

The importance of adequate storage connected to a feeder main could not be over-estimated, provided that storage was really used and the holder was not kept nearly full up all the time as a safety precaution, for not only was the load factor on the pumping plant improved, but at the same time an emergency reservoir could be held ready to assist in maintaining a steady production of gas if any of the works holders were out of commission for repairs or other causes. Works holders were in many cases substantially larger than any that were likely to be connected to feeder main systems; and their passing out of commission, even temporarily, could throw a difficult burden upon gas making and distribution plant alike. While this state of affairs was an inevitable result of the manner in which the gas industry had developed, the growth of the larger undertakings—soon, perhaps, to be accelerated even more—provided an opportunity for placing storage facilities at the point of demand.

The suggestion of installing peak load plant at remote holder stations was an intriguing one, but he could not feel that this was economically desirable with conventional forms of gas-making plant, apart altogether from the effect upon local inhabitants who, in many cases, had heaved a sigh of relief when the gas manufacturing process had departed from their town to a more centralized source.

The author had mentioned the facility with which pressure-loaded district governors could be adjusted to meet varying levels of demand. Some few years ago he (Mr. Tate) was associated with some experiments with weight-loaded governors, using the pressure of the gas in the feeder main to operate pistons and diaphragms under the control of normal public lighting clock controllers to place weights upon and remove them from governor bells at predetermined times, through systems of wires and pulleys or levers. Although the apparatus was crude, it was simple, the results being most encouraging. While obviously the scope of the device was limited, increases of outlet pressure at peak loads were readily obtained.

On the subject of mainlaying practice he felt that with all the experience of the late war behind them, much greater use could be made of mechanical aids than seemed general in the gas industry. Even mains of comparatively small diameter could be laid economically with the aid of machinery, and British manufacturers were rapidly coming down the scale of size in their production of such plant. The normal trench excavator of the endless chain and bucket type could be hired to remove earth at a cost of 4s. 2d. per cu.yd., for a reasonable length of trench, and for short road crossings the cost was little more than twice as much. These figures compared more than favourably with the Portsmouth Undertaking's ascertained cost of 10s. and 15s. per cu.yd. of excavation in virgin ground and tarmac road respectively, when such a trench was excavated by hand. The bucket excavator was, however, expensive to buy and was also somewhat fastidious in its choice of ground, anything in the way of boulders or hard lumps upsetting its digestion completely. In these circumstances, or in hard chalk, the back-acting shovel on caterpillar tracks was a useful alternative and, although slow, remained economical in normal soils. In regard to the bulldozer, he reserved judgment, because marvellous machine though it was, it always seemed to affect its driver with a curious *joie de vivre*, derived no doubt from a sense of invincible power, that caused a local devastation often requiring the use of considerable tact to explain away to infuriated owners or local authorities.

Pumping Power Requirements

Mr. W. T. Hird (Sheffield Gas Company) remarked that the author rightly drew attention to the disproportionate effect on pumping power requirements of a winter load double that of summer, and there could be no better way of illustrating the importance of reducing this seasonal load differential by developing as fully as possible base load gas usage. Much of this base load must come from industry, and the effect of steady all-the-year-round industrial use of gas on the pumping load factor should not be forgotten when consideration was being given to tariffs for such loads. Balanced load development designed to reduce seasonal peaks was a factor of considerable importance in the operation of a high pressure gas grid, and was an essential feature of economical transmission.

The full domestic gas service would obviously create a most unfavourable seasonal load factor, and it would be interesting to know whether the pumping costs given have been weighted to allow for this.

The author had stated that steel pipes were used in subsidence areas and for high pressure mains. No mention was made of the use of spun iron pipes with flexible joints as a possible alternative both for high pressure mains and in certain subsidence areas. In mining districts where widespread ground movement could take place as result of subsidence due to colliery working, a steel main rigidly jointed by welding required expansion joints at frequent intervals if stress in the main with resultant damage was to be avoided. In such areas it would appear better to use flexible joints instead of welded joints, as each joint then acted as an expansion joint in miniature and prevented the cumulative build-up of stresses. In the Sheffield and District Gas Company's area they had laid some miles of spun cast iron pipes with flexible joints in mining areas subject to a considerable amount of ground movement with most satisfactory results. The fact that spun iron pipes were individually less flexible than steel pipes did not appear to matter, probably because in such cases the flexibility of individual pipes was of less importance than the flexibility of a length of laid main. The strength and flexibility of individual pipes were, of course, of supreme importance where severe local subsidence was to be expected; and steel pipe had no rival for such use.

Many miles of spun iron mains with flexible joints had also been laid for their high pressure grids both for purified and crude gas with equally satisfactory results, and from the details given in the section of the paper on grids similar mains had been used for other high pressure grids. If, as now seemed probable, the rubber rings in flexible joints stood the test of time, there would seem to be little doubt that, owing to their longer resistance to corrosion, spun iron pipes with flexible joints would be used in situations where and for pressures which, until recently, only steel pipes were thought to be suitable. The advent of the flexible joint for cast iron pipes must, he thought, be regarded as a factor of great significance and one which was already materially affecting mainlaying practice.

"Economics for Everyman"

A "Gas Journal" Review

Despite the beguiling title, Mr. Arthur Coe's "Economics for Everyman" (Chapman and Hall, 15s.) is not just another exhortation to those who still hestitate to worship at the shrine of the "dullest science" or merely another primer of economic theory. It is a refreshing and welcome reconsideration of the whole workings of the industrial state—refreshing because it argues from fundamentals and is free from jargon, welcome as any such reconsideration must be at a time when legislation is making vast changes in the structure of so many industrial states.

Mr. Coe takes his text from John Ruskin: "I believe the sudden and extreme inequalities of demand which necessarily arise in the mercantile operation of an active nation constitute the only essential difficulty which has to be overcome in a just organization of labour." Thus he stands somewhere amid the press of "individual socialists" who seek to make a balance between the *laisser-faire* economics of Adam Smith and the national socialist "closed state" of Fichte. Arguing logically, Mr. Coe here erects a vision of a system which reconciles personal freedom with economic security for all.

At the bottom of Mr. Coe's argument is the idea that if we accept the principle of the division of labour we must also accept the principle of management and control. The great difficulty, as the author realizes, is how to avoid the economically wasteful bureaucracy which now arises when we establish central controls, just as wasteful as totally unplanned free enterprise. "An incompetent employer will put himself out of business by his own foolishness, but who is to discharge the clever but incompetent public planning authority?"

Mr. Coe believes that there is a case for nationalization where an industry has lost its initiative and leadership. The question of who is to decide when an industry has reached this state is left unanswered—like a number of Mr. Coe's arguments, it presupposes a much higher moral stature among men than at present exists.

Mr. Coe's most important contribution is a design for a currency standard which aims at balancing goods produced at all times with the prices actually paid for them. The basis of such a currency he takes as labour, which, after all, is the fount of all production. His method involves an extension of the banking system, "money on account" largely taking the place of cash payment. To back this idea he evolves a system of basic price which seeks to maintain prices as their costs. This notion Mr. Coe has derived from the South Metropolitan Gas Act of 1920, to which he devotes an interesting section.

"Economics for Everyman" is a book for anyone in industry who realizes (or fails to realize) that his work is part of a grander scheme of national activity.

The Board of Trade announces that a new consolidated list of import restrictions has been issued. This incorporates all amendments made to the former list which was issued in March, 1947, in so far as they are still operative. Copies of this list, which is called "Control of Imports into the United Kingdom, Notice to Importers, No. 292," are obtainable from the Import Licensing Department, Board of Trade, 189, Regent Street, W.1. Tel. Regent 4090.

A Party of Home Service Advisers from various parts of the gas supply area covered by the United Gas Corporation, Ltd., led by Miss Swindells, recently visited the showrooms and experimental kitchen at Messrs. R. & A. Main's head office in Grosvenor Gardens S.W.1. They were received by Mr. A. Forshaw, Chief Chemist, and Miss Gompertz, Chief Cookery Demonstrator, who explained the firm's latest appliances, especially the various forms of the No. 177 cooker, including the model with four boiling-burner hotplate, in which the visitors were particularly interested.